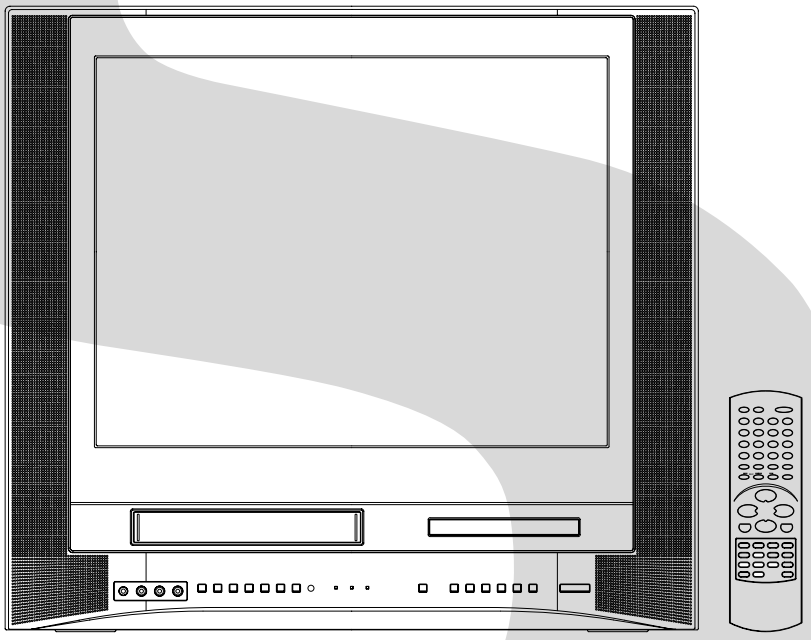
TOSHIBA

FILE NO. 140-200210

SERVICE MANUAL

COLOR TELEVISION/ VIDEO CASSETTE RECORDER/ DVD VIDEO PLAYER

MW20FM1



CAUTION

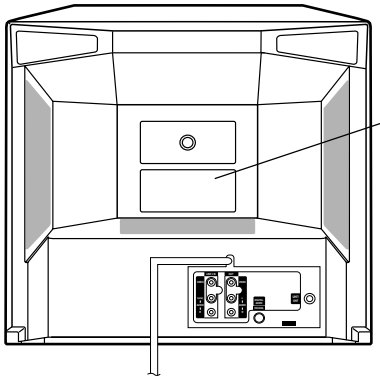
THIS DIGITAL VIDEO PLAYER EMPLOYS A LASER SYSTEM.

TO ENSURE PROPER USE OF THIS PRODUCT, PLEASE READ THIS SERVICE MANUAL CAREFULLY AND RETAIN FOR FUTURE REFERENCE. SHOULD THE UNIT REQUIRE MAINTENANCE, CONTACT AN AUTHORIZED SERVICE LOCATION-SEE SERVICE PROCEDURE.

USE OF CONTROLS, ADJUSTMENTS OR THE PERFORMANCE OF PROCEDURES OTHER THAN THOSE SPECIFIED HEREIN MAY RESULT IN HAZARDOUS RADIATION EXPOSURE.

TO PREVENT DIRECT EXPOSURE TO LASER BEAM, DO NOT TRY TO OPEN THE ENCLOSURE. VISIBLE LASER RADIATION MAY BE PRESENT WHEN THE ENCLOSURE IS OPENED. DO NOT STARE INTO BEAM.

Location of the required Marking
The rating sheet and the safety caution are on the rear of the unit.



CERTIFICATION: COMPLIES WITH FDA RADIATION PERFORMANCE STANDARDS, 21 CFR SUBCHAPTER J.

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage peripheral circuit, etc.
Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.
Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the VERSION LETTER.)

1. MODEL NUMBER and VERSION LETTER
   The MODEL NUMBER can be found on the back of each product and the VERSION LETTER can be found at the end of the SERIAL NUMBER.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

IMPORTANT SAFEGUARDS

1. **READ INSTRUCTIONS**
   All the safety and operating instructions should be read before the unit is operated.
2. **RETAIN INSTRUCTIONS**
   The safety and operating instructions should be retained for future reference.
3. **HEED WARNINGS**
   All warnings on the unit and in the operating instructions should be adhered to.
4. **FOLLOW INSTRUCTIONS**
   All operating and use instructions should be followed.
5. **CLEANING**
   Unplug this unit from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
6. **ATTACHMENTS**
   Do not use attachments not recommended by the unit's manufacturer as they may cause hazards.
7. **WATER AND MOISTURE**
   Do not use this unit near water. For example, near a bathtub, washbowl, kitchen sink, or laundry tub, in a wet basement, or near a swimming pool.
8. **ACCESSORIES**
   Do not place this unit on an unstable cart, stand, tripod, bracket, or table. The unit may fall, causing serious injury, and serious damage to the unit. Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer.

PORTABLE CART WARNING
(symbol provided by RETAC)

S3126A

8A. An appliance and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the appliance and cart combination to overturn.

9. **VENTILATION**
   Slots and openings in the cabinet and in the back or bottom are provided for ventilation, to ensure reliable operation of the unit, and to protect it from overheating. These openings must not be blocked or covered. The openings should never be blocked by placing the unit on a bed, sofa, rug, or other similar surface. This unit should never be placed near or over a radiator or heat source. This unit should not be placed in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.
10. **POWER SOURCES**
    This unit should be operated only from the type of power source indicated on the rating plate. If you are not sure of the type of power supply to your home, consult your appliance dealer or local power company. For units intended to operate from battery power, or other sources, refer to the operating instructions.
11. **GROUNDING OR POLARIZATION**
    This unit is equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature. If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug. If your unit is equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin, this plug will only fit into a grounding-type power outlet. This too, is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.
12. **POWER-CORD PROTECTION**
    Power-supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the appliance.
13. **LIGHTNING**
    To protect your unit from a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the unit due to lightning and power line surges.
14. **POWER LINES**
    An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits, as contact with them might be fatal.
15. **OVERLOADING**
    Do not overload wall outlets and extension cords, as this can result in a risk of fire or electric shock.
16. **OBJECT AND LIQUID ENTRY**
    Do not push objects through any openings in this unit, as they may touch dangerous voltage points or short out parts that could result in fire or electric shock. Never spill or spray any type of liquid into the unit.
17. **OUTDOOR ANTENNA GROUNDING**
    If an outside antenna or cable system is connected to the unit, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Section 810 of the National Electrical Code, ANSI/NFPA 70, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.
18. **SERVICING**
    Do not attempt to service this unit yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

IMPORTANT SAFEGUARDS (CONTINUED)

19. DAMAGE REQUIRING SERVICE

Unplug this unit from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a. When the power-supply cord or plug is damaged.
b. If liquid has been spilled, or objects have fallen into the unit.
c. If the unit has been exposed to rain or water.
d. If the unit does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions, as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the unit to its normal operation.
e. If the unit has been dropped or the cabinet has been damaged.
f. When the unit exhibits a distinct change in performance, this indicates a need for service.

20. REPLACEMENT PARTS

When replacement parts are required, be sure the service technician uses replacement parts specified by the manufacturer or those that have the same characteristics as the original parts.
Unauthorized substitutions may result in fire, electric shock or other hazards.

21. SAFETY CHECK

Upon completion of any service or repairs to this unit, ask the service technician to perform safety checks to determine that the unit is in proper operating condition.

22. WALL OR CEILING MOUNTING

The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

23. HEAT

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

24. DISC TRAY

Keep your fingers well clear of the disc tray as it is closing. It may cause serious personal injury.

25. CONNECTING

When you connect the product to other equipment, turn off the power and unplug all of the equipment from the wall outlet. Failure to do so may cause an electric shock and serious personal injury. Read the owner's manual of the other equipment carefully and follow the instructions when making any connections.

26. SOUND VOLUME

Reduce the volume to the minimum level before you turn on the product. Otherwise, sudden high volume sound may cause hearing or speaker damage.

27. SOUND DISTORTION

Do not allow the product output distorted sound for a longtime. It may cause speaker overheating and fire.

28. HEADPHONES

When you use the headphones, keep the volume at a moderate level. If you use the headphones continuously with high volume sound, it may cause hearing damage.

29. LEASER BEAM

Do not look into the opening of the disc tray or ventilation opening of the product to see the source of the laser beam. It may cause sight damage.

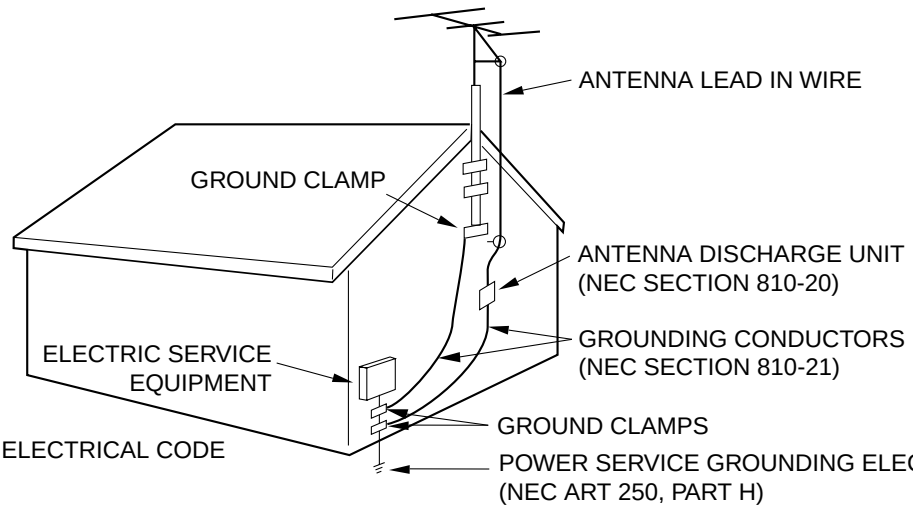
30. DISC

Do not use a cracked, deformed, or repaired disc. These discs are easily broken and may cause serious personal injury and product malfunction.

31. NOTE TO CATV SYSTEM INSTALLER

This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

EXAMPLE OF ANTENNA GROUNDING AS PER THE NATIONAL ELECTRICAL CODE



NEC-NATIONAL ELECTRICAL CODE

S2898A

TAPE REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the DVD/VCR block from the main unit and the **Fig. 1** below can be seen. **(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)**
2. Remove one screw of the Loading Motor from the insert hole for screw driver and remove the Loading Motor.
3. Rotate the Pinch Roller Cam in the direction of the arrow by hand to slacken the Video Tape. **(Refer to Fig. 2)**
4. Rotate the Clutch Ass'y either of the directions to wind the Video Tape in the Cassette Case.
5. Repeat the above step 3~4. Then take out the Video Cassette from the Deck Chassis. Be careful not to scratch on the tape.

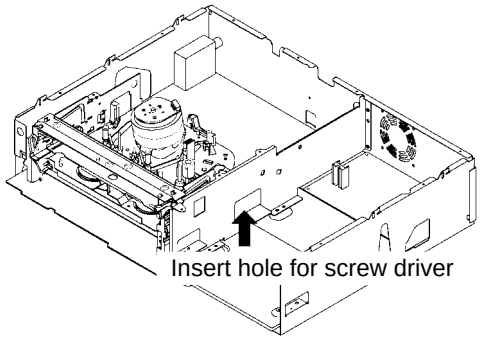


Fig. 1

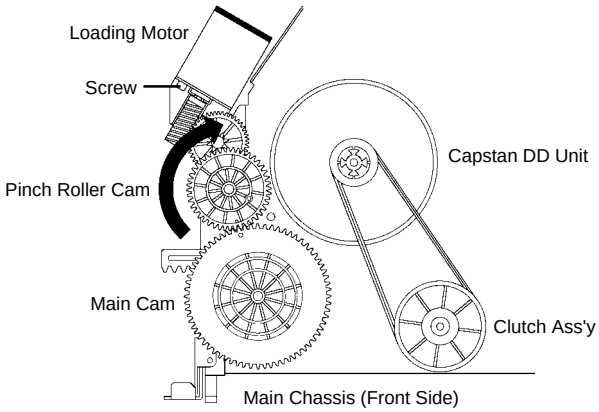


Fig. 2

DISC REMOVAL METHOD AT NO POWER SUPPLY

1. Remove the Top Cabinet and Front Cabinet. **(Refer to item 1 of the DISASSEMBLY INSTRUCTIONS.)**
2. Rotate the black gear of Deck CD section in the direction of the arrow by hand, remove the disc from Deck CD. **(Refer to Fig. 3)**

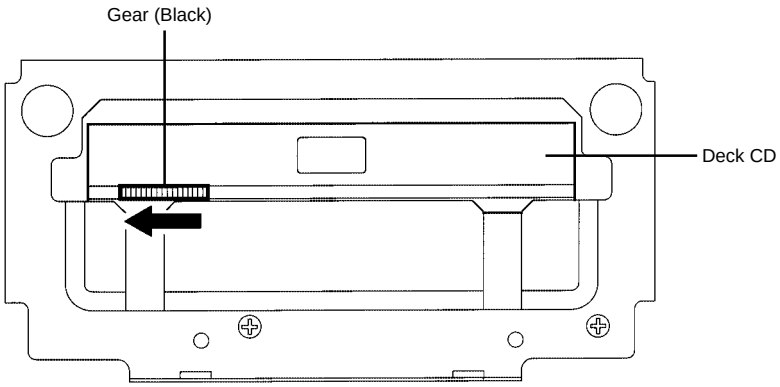


Fig. 3

PARENTAL CONTROL - RATING LEVEL

4 DIGIT PASSWORD CANCELLATION

If the stored 4 digit password in the Rating Level menu needs to be cancelled, please follow the steps below.

1. Turn Unit ON.
2. Confirm that no disc on the disc tray.
3. Press and hold the '7' key on the remote control unit.
4. Simultaneously press and hold the 'STOP' key on the front panel.
5. Hold both keys for more than 3 seconds.
6. The On Screen Display message 'INITIALIZED' will appear.
7. The 4 digit password has now been cleared.

NB: The above procedure will reset ALL of the player's settings to the default factory state.

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GENERAL SPECIFICATIONS

G-1	**TV System**	CRT		CRT Size / Visual Size	20 inch / 508.0 mmV
				CRT Type	Flat
				Deflection	90 degree
				Magnetic Field BV/BH	+ 0.45 G / 0.18 G
		Color System			NTSC
		Speaker			2 Speaker
				Position	Front
				Size	1.8 x 3.9 Inch
				Impedance	8 ohm
		Sound Output		MAX	1.5W + 1.5W
				10%(Typical)	1.5W + 1.5W
G-2	**VCR System**	System			VHS Player / Recorder
		Video System			NTSC
		Hi-Fi STEREO			Yes
		NTSC PB			-
		Deck		DECK	OVD-7
				Loading System	Front
				Motor	3
		Heads	Video Head		4 Heads
			FM Audio Head		2 Heads
			Audio /Control		Mono /Yes
			Erase(Full Track Erase)		Yes
		Tape Speed	Rec	PAL	-
				NTSC	SP/SLP(EP)
			Play	PAL	-
				NTSC	SP/SLP(EP)
		Fast Forward / Rewind Time (Approx.) at 25oC			FF:1'48"/REW:1'48"
				with Cassette	T-120
		Forward/Reverse Picture Search		NTSC or PAL-M	SP/SLP(EP) = 3x,5x / 9x,15x
		Frame Advance			1/10
		Slow Speed			1/10
G-3	**DVD System**	Color System			NTSC
		Disc			DVD, CD-DA, CD-R/RW, Video CD
		Disc Diameter			120 mm , 80 mm
		Deck		Disc Loading System	Front Loading
				Motor	3 Motors
		Pick up			1-Lens 2-Beams System
		Playback time(Max)	DVD 1-L	DVD 1-Layer	135min (4.7GB)
				DVD 2-Layer	245min (8.5GB)
				CD	74min
				VIDEO CD	74min
		Search speed		Fwd	2-100 times / 4 step (DVD) 4-8 times / 2 step (CD) 5-15 times / 2 step (VIDEO CD)
				Actual	2-70 times (DVD) 4-12times (CD) 4-20times (VIDEO CD)
				Rew	2-100 times / 4 step (DVD) 4-8 times / 2 step (CD) 5-15 times / 2 step (VIDEO CD)
				Actual	2-70 times (DVD) 4-16times (CD) 4-20times (VIDEO CD)
		Slow speed		Fwd	1/8-1/2 times (DVD, VIDEO CD)
				Actual	1/7-1/2times (DVD, VIDEO CD)
				Rew	-
				Actual	-
G-4	**Tuning System**	Broadcasting System			US System M
		Tuner and Receive CH		System	1 Tuner
				Destination	US(w/CATV)
				Tuning System	F-Synth
				Input Impedance	VHF/UHF 75 ohm
				CH Coverage	2~69, 4A,A-5~A-1, A~I, J~W,W+1~W+84
		Intermediate Frequency		Picture(FP)	45.75MHz
				Sound(FS)	41.25MHz
				FP-FS	4.5MHz
		Preset CH			No
		Stereo/Dual TV Sound			US-Stereo
		Tuner Sound Muting			Yes

GENERAL SPECIFICATIONS

G-5	**Signal**	Video Signal	Input Level	1 V p-p/75 ohm
			Output Level	1 V p-p/75 ohm
			S/N Ratio (Weighted) at DVD Mode	65dB
			S/N Ratio (Weighted) at VCR Mode	50dB
			Horizontal Resolution at DVD Mode	400 Lines
			Horizontal Resolution at VCR(SP)Mode	220 Lines
		RGB Signal	Output Level	-
		Audio Signal	Input Level	-8.0dBm/50k ohm
		(0dB=0.775Vrms)	Output Level	-8.0dBm/1k ohm
			Digital Output Level	0.5 V p-p/75 ohm(DVD)
			S/N Ratio at DVD (Weighted)	90 dB
			S/N Ratio at VCR(SP) (Weighted)	38 dB
			Harmonic Distortion at DVD Mode	0.1% (1kHz)
			Harmonic Distortion at VCR(SP) Mode	1.5% (1kHz) Typical
			Frequency Response :	
			DVD Mode at DVD	4Hz - 22kHz
			at VIDEO CD	4Hz - 20kHz
			at CD	4Hz - 20kHz
			VCR Mode at SP	100Hz - 10kHz
			at LP	-
			at SLP(EP)	100Hz - 4kHz
		Hi-Fi Audio Signal	Dynamic Range : More than	90 dB
			Wow And Flutter : Less than	0.01 %Wrms
			Channel Separation : More than	60 dB
			Harmonic Distortion : Less than	1.0 %
G-6	**Power**	Power Source	AC	120V,60Hz
			DC	-
		Power Consumption	at AC	120 W at 120 V 60 Hz
			at DC	-
			Stand by (at AC)	4 W at 120 V 60 Hz
			Per Year	-
		Protector	Power Fuse	Yes
			Dew Sensor	No
G-7	**Regulation**		Safety	UL
			Radiation	FCC
			X-Radiation	DHHS
			Laser	DHHS
G-8	**Temperature**		Operation	+5oC ~ +40oC
			Storage	-20oC ~ +60oC
G-9	**Operating Humidity**			Less then 80% RH

GENERAL SPECIFICATIONS

G-10	On Screen Display (TV/VCR)	Menu			Yes
		Menu	Type		Character
		Timer Rec Set			Yes
		Channel Setup			Yes
			TV/CATV		Yes
			Auto CH Memory		Yes
			Add/ Delete		Yes
			Guide CH Set		No
		TV Setup			Yes
			V-chip Set		Yes
			On/Off Timer Set		Yes
			Picture		Yes
			Audio		Yes
			Sap On/Off		Yes
		Auto Repeat On/Off			Yes
		System Setup			Yes
			Clock Set		Yes (Calendar 12h)
			Language		Yes
			Auto Clock On/Off		Yes
			Standard Time		Yes
			Daylight Saving Time		Yes
		Commercial Advance			No
			Marking On/Off		No
			Blueback On/Off		No
			Playback Auto/Manual		No
			Unmarked Tape		No
		Movie Advance			No
			Go To Movie		No
			Go To Preview		No
		G-CODE(or SHOWVIEW or PLUSCODE)No. Entry			No
		TV/VCR			Yes
		DVD			Yes
		Clock / Date			Yes
		CH/AV			Yes
		Tape Counter(Linear Counter)			Yes
		Tape Speed			Yes
		Sleep Time			Yes
		Stereo/Audio Output			Yes
			Bilingal		No
			SAP		Yes
		Control Level	Volume		Yes
			Bright / Contrast / Sharpness / Color		Yes
			Tint		Yes
			Bass/Treble/Balance		Yes
			Manual Tracking		Yes
		Play/Stop/FF/Rew/Rec/OTR/T-Rec/Pause/Eject/Tape In (Symbol Mark)			Yes
		Auto Tracking/Manual Tracking			Yes
		Caption / Text			Yes
		Index			No
		Muting			Yes
		Hi-Fi			Yes
		Repeat			Yes
		Zero Return			No
		DEW			No

GENERAL SPECIFICATIONS

G-11	**On Screen Display (DVD)**	Menu		Yes
			Menu Type	Icon
		Picture		Yes
			TV Shape	Yes
		Output Sound		Yes
			Audio Out Select	Yes
			Dynamic Range Control	Yes
			Karaoke Vocal	Yes
		Language		Yes
			On-Screen Language	Yes
			Disc Menu Language	Yes
			Audio Language	Yes
			Subtitle Language	Yes
		Display		Yes
			On-Screen Displays	Yes
			Background	Yes
			Screen Saver	Yes
		Operational		Yes
			Pause/Still	Yes
			Parental Lock	Yes
			Title Stop	Yes
			PBC	Yes
		Initial Setup		Yes
			On-Screen Language	Yes
			TV Shape	Yes
			Audio Out Select	Yes
		Open		Yes
		Close		Yes
		No disc		Yes
		Reading		Yes
		Play		Yes
		Still/Pause		Yes
		Stop		Yes
		Prohibit Mark		Yes
		Step		Yes
		Skip+		Yes
		Skip-		Yes
		Random		Yes
		Repeat		Yes
		A-B Repeat		Yes
		Slow+ ##		Yes
		Slow- ##		No
		Search+ ##		Yes
		Search- ##		Yes
		Resume		Yes
		Title No.		Yes
		Chapter No.		Yes
		Track No.		Yes
		Time		Yes
		Sub Title No.		Yes
		Angle No.		Yes
		Audio No.		Yes
		Zoom		Yes
		Enter		Yes
		Exit		Yes
		Bit Rate		Yes
		Memory		Yes
		Screen Saver		Yes
		E.A.M		No
G-12	**OSD Language**	TV/VCR		English French Spanish
		DVD		English French Spanish

G-13	**Clock,Timer and Timer Back-up**	Calendar		1990/1/1 ~ 2081/12/31	
		Timer Events		8 Program/ 1 Month	
		One Touch Recording Max Time		5 Hours	
		OTPB Valid Time		-	
		Sleep Timer	Max Time	120	Min
			Step	10	Min
		On/Off Timer	Program(On Timer / Off Timer)	1	Program
		Auto Shut Off	No Signal	15	Min
			No Operation	-	Min
		Timer Back-up (at Power Off Mode)		5	Sec

GENERAL SPECIFICATIONS

G-14	**Remote Control Unit**	Unit(for TOSHIBA)		RC-FG
		Glow in Dark Remocon		Yes
		Format		NEC
		Custom Code		40-BFh,44-BBh
		Power Source	Voltage(D.C)	3V
			UM size x pcs	UM-4 x 2 pcs
		Total Keys		48 Key
		Keys	TV/VCR	Yes
			DVD	Yes
			Power	Yes
			1	Yes
			2	Yes
			3	Yes
			4	Yes
			5	Yes
			6	Yes
			7	Yes
			8	Yes
			9	Yes
			0	Yes
			Channel-	Yes
			Channel+	Yes
			Volume-	Yes
			Volume+	Yes
			Display	Yes
			Sleep	Yes
			Audio Select	Yes
			Mute	Yes
			Channel Return / Skip-	Yes
			Closed Caption / Skip+	Yes
			T-REC	Yes
			Rec(T-Rec/OTR)	Yes
			Rec/OTR	Yes
			Slow+	Yes
			Play	Yes
			Stop	Yes
			Rew	Yes
			F. Fwd	Yes
			Pause / Still	Yes
			CM Skip / Memory	Yes
			SP/SLP / Return	Yes
			Counter Reset / Angle	Yes
			Zero Return / Subtitle	Yes
			Input Select / Zoom	Yes
			Menu /Set Up	Yes
			Program / Repeat A-B	Yes
			D.Tracking / Top Menu	Yes
			Tracking+ / DVD Menu	Yes
			Tracking- / Play Mode	Yes
			Cancel/Clear	Yes
			3D Surround	No
			Cursor Up	Yes
			Cursor Down	Yes
			Cursor Left	Yes
			Cursor Right	Yes
			Enter	Yes
			VCR Plus+	No
			One More Search	No
			Remain/Counter	No
			Eject	No
			Index-	No
			Index+	No

GENERAL SPECIFICATIONS

G-15	Features	Auto Head Cleaning		Yes
		Auto Tracking		Yes
		HQ (VHS Standard High Quality)		Yes
		Auto Power On, Auto Play, Auto Rewind, Auto Eject		Yes
		VIDEO PLUS+(SHOWVIEW,G-CODE)		No
		Auto Clock		Yes
		Forward / Reverse Picture Search		Yes
		Reverse Slow		No
		One Touch Playback		No
		Auto CH Memory		Yes
		Closed Caption		Yes
		TV Auto Shut off Function		Yes
		End Call		No
		Index Search		No
		SQPB		No
		CATV		Yes
		CM Skip(30sec x 6 Times)		Yes
		Comb Filter		Yes
		TV Monitor		No
		Program Extend		No
		Choke Coil		No
		Energy Star		Yes
		Protect of FBT Leak Circuit		Yes
		Zero Return		Yes
		Power On Memory		No
		Dirty Head		No
		V-chip USA V-chip		Yes
		CANADA V-chip		No
		CM Advance		No
		Movie Advance		No
		Surround (Spatializer)		No
		Parental Lock (DVD Only)		Yes
		VIDEO CD Playback		Yes
		MP3 Playback		No
		Digital Out	Dolby Digital	Yes
			PCM	Yes
			DTS	Yes
			MPEG1, MPEG2	Yes
		Down Mix Out	(Dolby Digtal, MPEG1,MPEG2)	Yes
		Spatializer (N-2-2)		No
		Screen Saver		Yes
G-16	Accessories	Owner's Manual	Language	English
			w/Guarantee Card	Yes
		Remote Control Unit		Yes
		Battery		Yes
			UM size x pcs	UM-4 x 2 pcs
				No
		Rod Antenna		No
			Poles	-
			Terminal	-
		Loop Antenna		No
			Terminal	-
		U/V Mixer		No
		300 ohm to 75 ohm Antenna Adapter		Yes
		Antenna Change Plug		No
		DC Car Cord (Center+)		No
		AC Plug Adapter		No
		AC Cord		No
		AV Cord (2Pin-1Pin)		No
		Guarantee Card		No
		Registration Card		Yes
		ESP Card		No
		Warning Sheet		No
		Dew/AHC Caution Sheet		No
		Quick Set-up Sheet		No
		Circuit Diagram		No
		Service Facility List		No
		Important Safeguard		No

GENERAL SPECIFICATIONS

G-17	**Interface**	Switch	Front	Power (Tact)	Yes
				Channel Up	Yes
				Channel Down	Yes
				Volume Up	Yes
				Volume Down	Yes
				Play (VCR)	Yes
				Stop / Eject (VCR)	Yes
				F.FWD/Cue (VCR)	Yes
				Rew/Rev (VCR)	Yes
				REC/OTR (VCR)	Yes
				Play (DVD)	Yes
				Stop (DVD)	Yes
				Skip+ (DVD)	Yes
				Skip- (DVD)	Yes
				Open/Close (DVD)	Yes
				Input Select	No
				Main Power SW	No
		Indicator		Power	Red
				REC/OTR	Red
				T-REC	Red
				TV/VCR	No
				DVD	No
		Terminals	Front	Video Input	RCA x 1
				Audio Input	RCA x 2(Stereo)
				Other Terminal	Head Phone (Stereo & Mono, 3.5mm)
			Rear	Video Input	RCA x 1
				Audio Input	RCA x 2(Stereo)
				Video Output	RCA x1
				Audio Output	RCA x 2(Stereo)
				Digital Audio Output	Coaxial (DVD Only)
				VHF/UHF Antenna Input	F Type
				AC Inlet	No
G-18	**Set Size**			Approx. W x D x H (mm)	573 x 482 x 517
G-19	**Weight**			Net (Approx.)	27.0kg(59.5lbs)
				Gross (Approx.)	30.5kg(67.3lbs)
G-20	**Carton**		Master Carton		No
				Content	-
				Material	-
				Dimensions W x D x H(mm)	-
				Description of Origin	-
			Gift Box		Yes
				Material	Double/White
				Dimensions W x D x H(mm)	658 x 575 x 625
				Design	As per Buyer's
				Description of Origin	Yes
			Drop Test	Natural Dropping At	1 Corner / 3 Edges / 6 Surfaces
				Height (cm)	31
			Container Stuffing(40' container)		216 Sets
G-21	**Cabinet Material**			Cabinet Front	PS 94V0 DECABROM
				Cabinet Rear	PS 94V0 DECABROM

DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: BACK CABINET (Refer to Fig. 1-1)

1. Remove the 6 screws ①.
2. Remove the AC cord from the AC cord hook ②.
3. Remove the Back Cabinet in the direction of arrow.

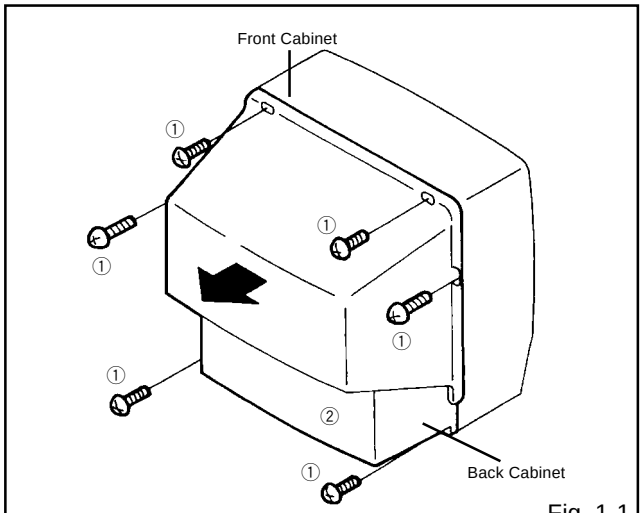


Fig. 1-1

1-2: CRT PCB (Refer to Fig. 1-2)

CAUTION: BEFORE REMOVING THE ANODE CAP, DISCHARGE ELECTRICITY BECAUSE IT CONTAINS HIGH VOLTAGE. BEFORE ATTEMPTING TO REMOVE OR REPAIR ANY PCB, UNPLUG THE POWER CORD FROM THE AC SOURCE.

1. Remove the Anode Cap.
   (Refer to REMOVAL OF ANODE CAP)
2. Disconnect the following connectors:
   (CP803 and CP805).
3. Remove the CRT PCB in the direction of arrow.

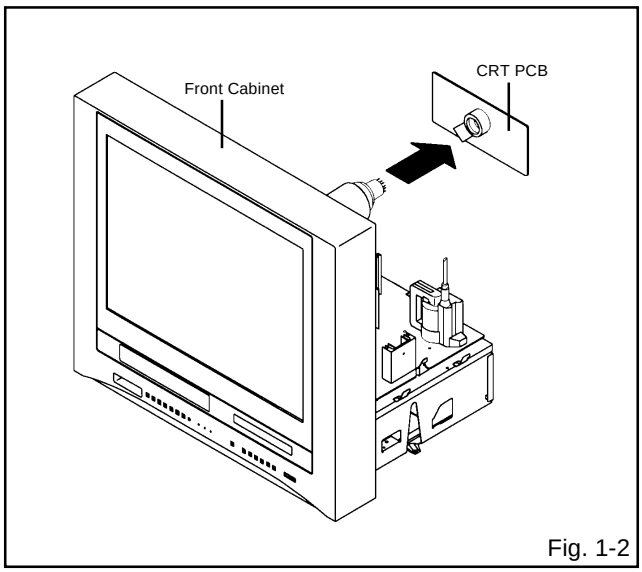


Fig. 1-2

1-3: TV/DVD/VCR BLOCK (Refer to Fig. 1-3)

1. Remove the 2 screws ①.
2. Disconnect the following connectors:
   (CP303, CP404 and CP1704).
3. Remove the TV/DVD/VCR Block in the direction of arrow.

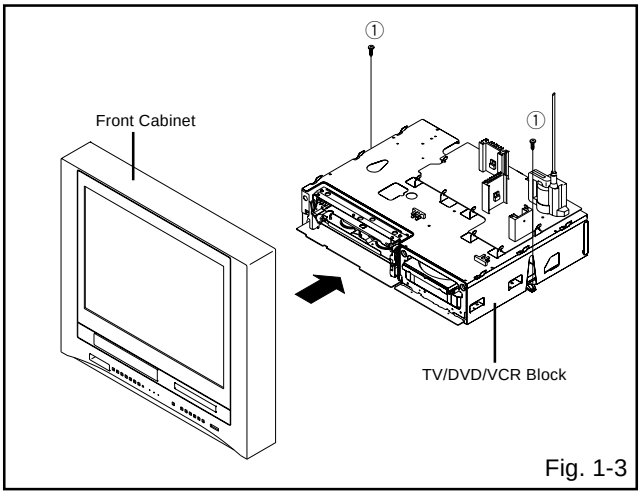


Fig. 1-3

1-4: MAIN PCB (Refer to Fig. 1-4)

1. Remove the 2 screws ①.
2. Remove the 4 screws ②.
3. Disconnect the following connectors:
   (CD602 and CD603).
4. Remove the Main PCB in the direction of arrow.

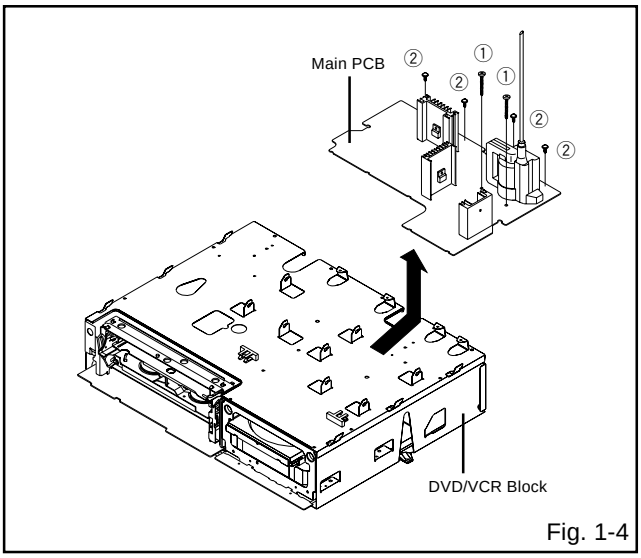


Fig. 1-4

DISASSEMBLY INSTRUCTIONS

1-5: TOP SHIELD ASS'Y (Refer to Fig. 1-5)

1. Remove the 9 screws ①.
2. Remove the Top Shield Ass'y in the direction of arrow.

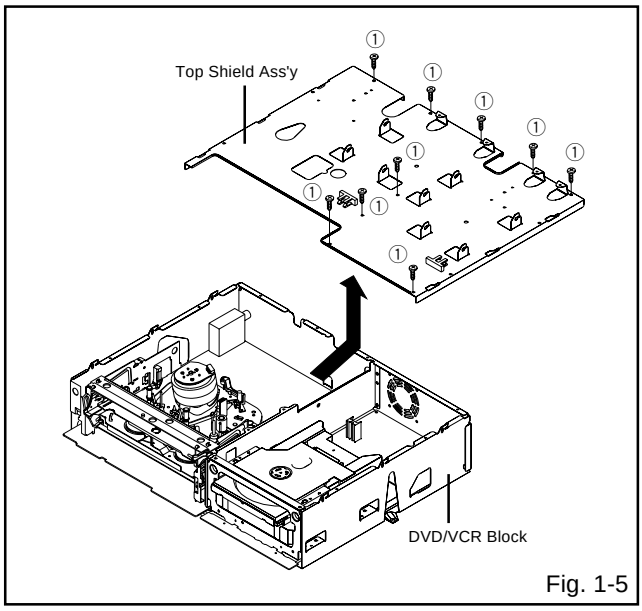


Fig. 1-5

1-6: OPERATION PCB/DVD PCB/CD DECK (Refer to Fig. 1-6)

1. Make the short circuit on the position as shown **Fig. 1-6** using a soldering. If you remove the Deck CD with no soldering, the Laser may be damaged.
2. Disconnect the following connectors: (CP2201, CP3605, CP8001 and CP8002).
3. Remove the 4 screws ①.
4. Remove the Angle Deck in the direction of arrow (A).
5. Remove the 2 screws ②.
6. Remove the Front Shield in the direction of arrow (B).
7. Remove the 2 screws ③.
8. Remove the Operation PCB in the direction of arrow (C).
9. Disconnect the following connectors: (CP2601, CP2602 and CP2603).
10. Remove the 4 screws ④.
11. Remove the CD Deck in the direction of arrow (D).
12. Remove the 4 screws ⑤.
13. Remove the DVD PCB in the direction of arrow (E).

NOTE

When the installation of the Deck CD, remove all the soldering on the short circuit position after the connection of Pick Up PCB and DVD PCB connector.

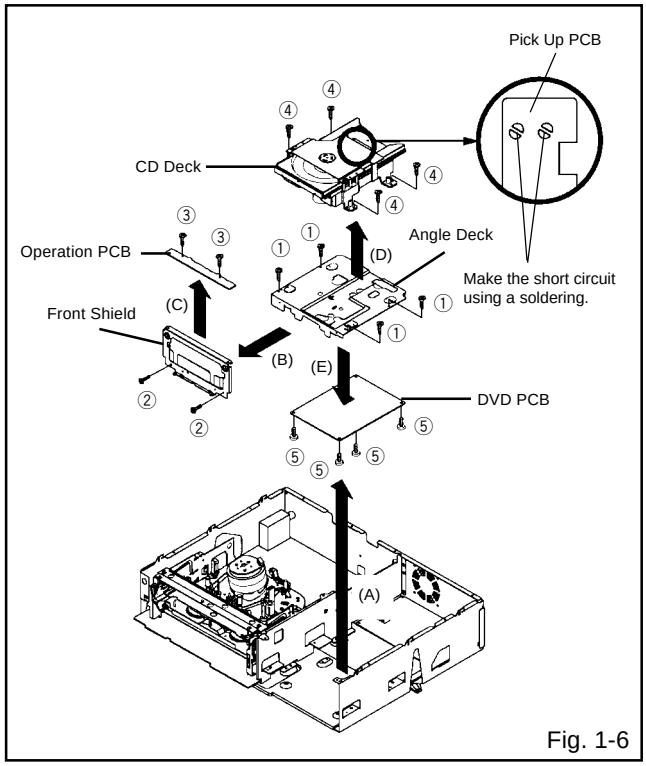


Fig. 1-6

1-7: POWER PCB (Refer to Fig. 1-7)

1. Disconnect the following connector: (CP3603).
2. Remove the 3 screws ①.
3. Remove the Power PCB in the direction of arrow.

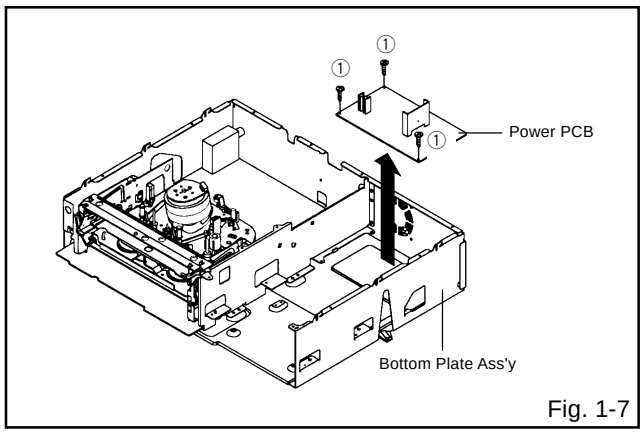


Fig. 1-7

DISASSEMBLY INSTRUCTIONS

1-8: VCR DECK (Refer to Fig. 1-8)

1. Move the Cassette Holder Ass'y to the back side.
2. Remove the 3 screws ①.
3. Remove the screw ②.
4. Disconnect the following connectors:
   (CP101, CP4501, CP4502 and CP4503).
5. Remove the AC Head Cover and VCR Deck in the direction of arrow.

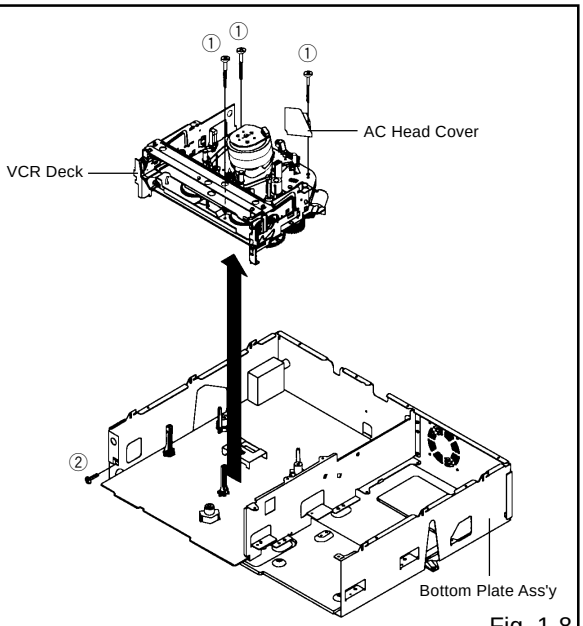


Fig. 1-8

1-9: VCR PCB (Refer to Fig. 1-9)

1. Remove the 5 screws ①.
2. Remove the Nut and Washer.
3. Remove the VCR PCB in the direction of arrow.

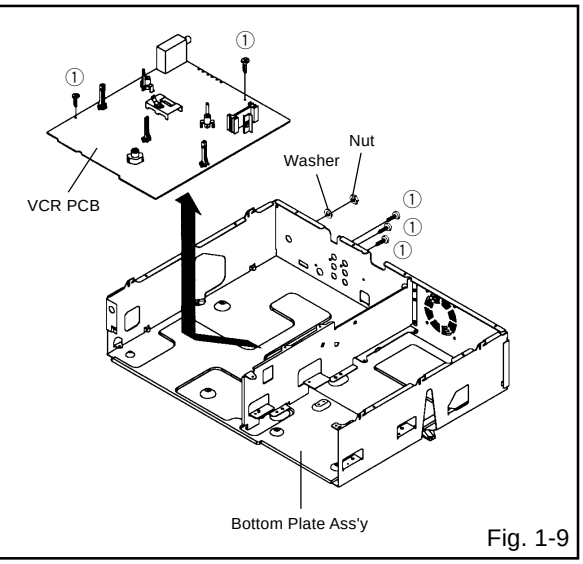


Fig. 1-9

DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF VCR DECK PARTS

2-1: TOP BRACKET (Refer to Fig. 2-1)

1. Extend the 2 supports ①.
2. Slide the 2 supports ② and remove the Top Bracket.

NOTE

1. After the installation of the Top Bracket, bend the support ① so that the Top Bracket is fixed.

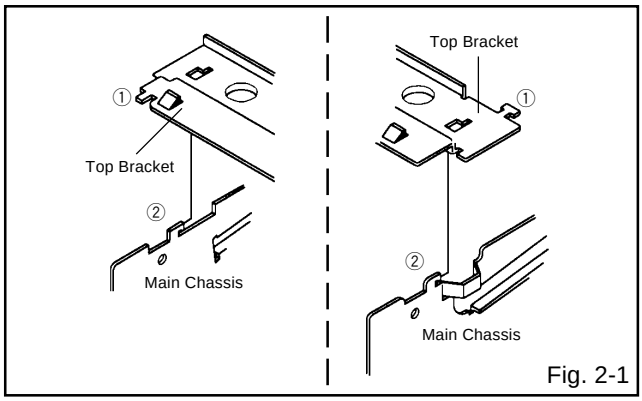


Fig. 2-1

2-2: CASSETTE HOLDER ASS'Y (Refer to Fig. 2-2)

1. Move the Cassette Holder Ass'y to the front side.
2. Push the Locker R to remove the Cassette Side R.
3. Remove the Cassette Side L.

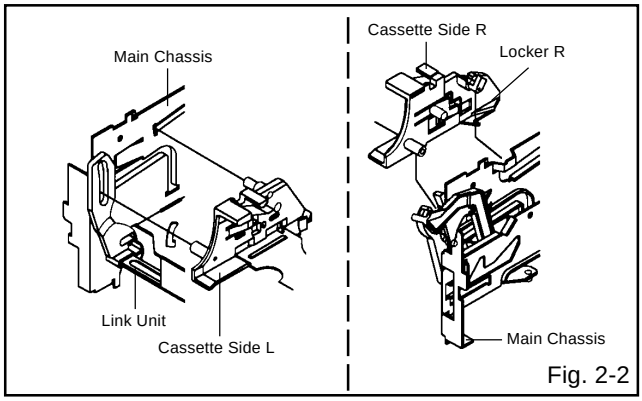


Fig. 2-2

2-3: CASSETTE SIDE L/R (Refer to Fig. 2-3-A)

1. Remove the Locker Spring.
2. Unlock the 4 supports ① and then remove the Cassette Side L/R.
3. Unlock the support ② and then remove the Locker R.

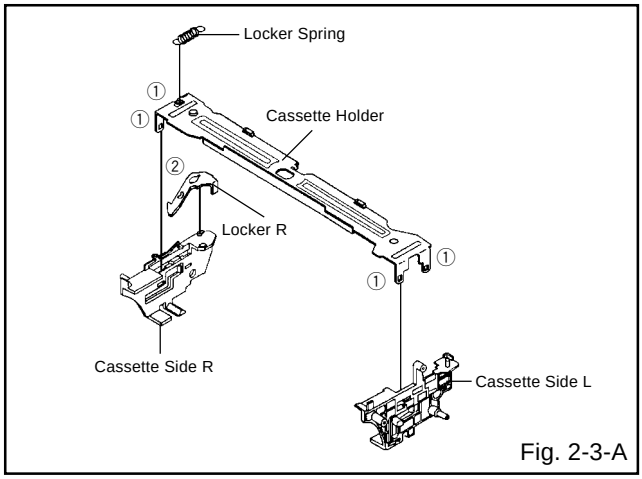


Fig. 2-3-A

NOTE

1. In case of the Locker R installation, check if the two positions of Fig.2-3-B are correctly locked.
2. When you install the Cassette Side R, be sure to move the Locker R after installing.

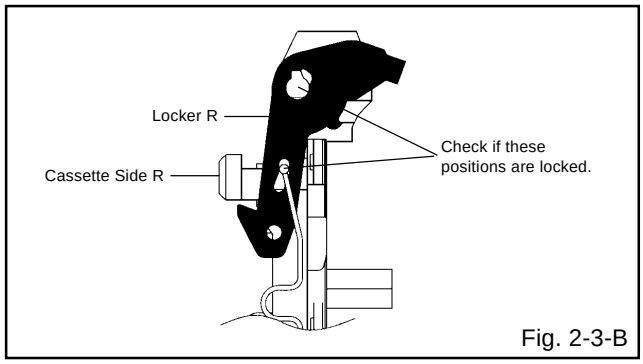


Fig. 2-3-B

2-4: LINK UNIT (Refer to Fig. 2-4)

1. Set the Link Unit to the Eject position.
2. Unlock the support ①.
3. Remove the (A) side of the Link Unit first, then remove the (B) side.

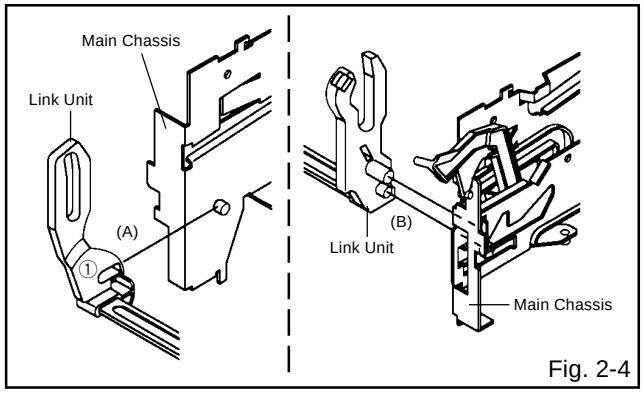


Fig. 2-4

2-5: LINK LEVER/FLAP LEVER (Refer to Fig. 2-5)

1. Extend the support ①.
2. Remove the Link Lever.
3. Remove the Flap Lever.

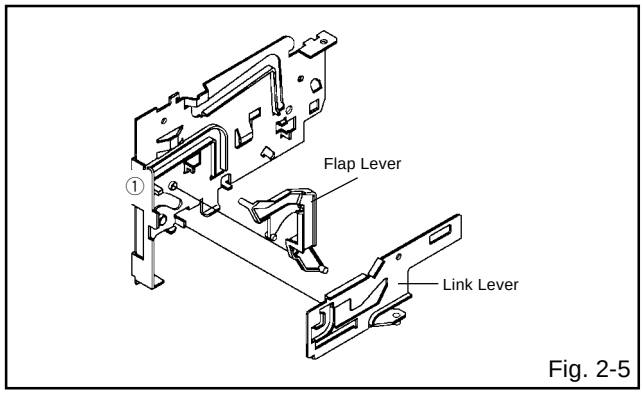


Fig. 2-5

DISASSEMBLY INSTRUCTIONS

2-6: LOADING MOTOR/WORM (Refer to Fig. 2-6-A)

1. Remove the screw ①.
2. Remove the Loading Motor.
3. Remove the Worm.

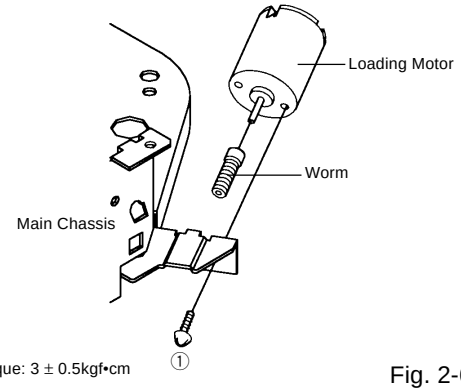


Fig. 2-6-A

NOTE

1. In case of the Worm installation, check if the value of the Fig. 2-6-B is correct.
2. In case of the Loading Motor installation, hook the wire on the Cassette Opener as shown Fig. 2-6-C.
3. When installing the wires between Capstan DD Unit and Loading Motor, connect them correctly as shown Fig. 2-6-D.

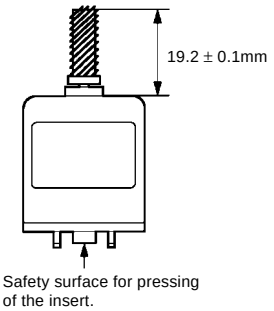


Fig. 2-6-B

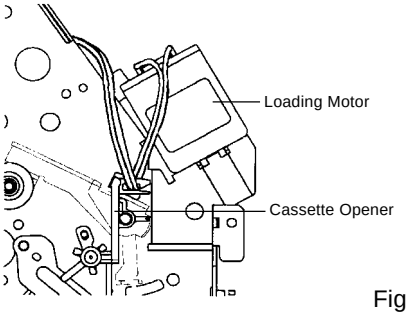


Fig. 2-6-C

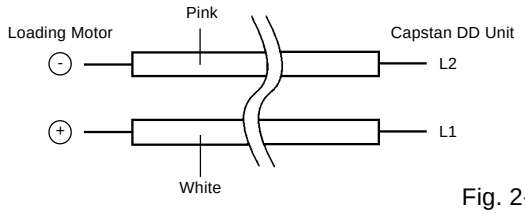


Fig. 2-6-D

2-7: TENSION ASS'Y (Refer to Fig. 2-7-B)

1. Turn the Pinch Roller Cam clockwise so that the Tension Holder hook is set to the position of Fig. 2-7-A to move the Tension Arm Ass'y.
2. Remove the Tension Spring.
3. Unlock the 2 supports ① and remove the Tension Band.
4. Unlock the support ② and remove the Tension Arm Ass'y.
5. Unlock the support ③ and remove the Tension Connect.
6. Float the hook ④ and turn it clockwise then remove the Tension Holder.

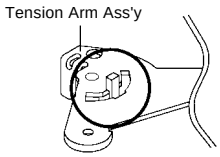


Fig. 2-7-A

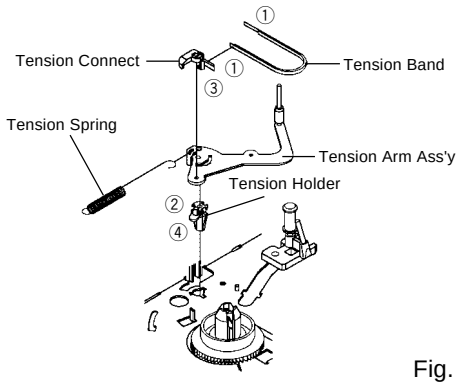


Fig. 2-7-B

NOTE

1. In case of the Tension Band installation, note the direction of the installation. **(Refer to Fig. 2-7-C)**
2. In case of the Tension Band installation, install correctly as Fig. 2-7-D.
3. In case of the Tension Connect installation, install as the circled section of Fig. 2-7-E.

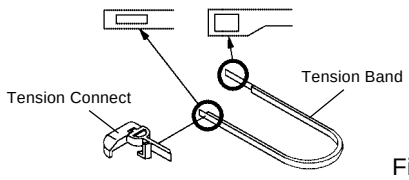


Fig. 2-7-C

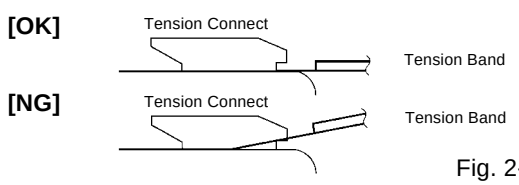


Fig. 2-7-D

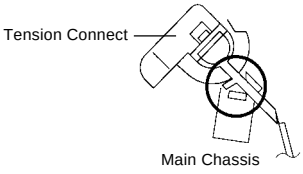


Fig. 2-7-E

DISASSEMBLY INSTRUCTIONS

2-8: T BRAKE ARM/T BRAKE BAND (Refer to Fig. 2-8-A)

1. Remove the T Brake Spring.
2. Turn the T Brake Arm clockwise and bend the hook section to remove it.
3. Unlock the 2 supports ① and remove the T Brake Band.

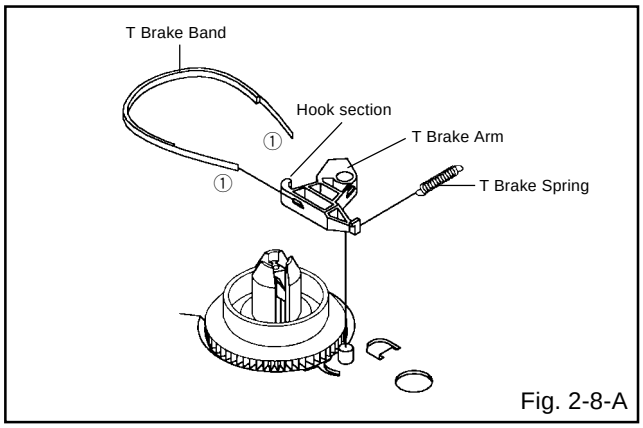


Fig. 2-8-A

NOTE

1. In case of the T Brake Band installation, install correctly as Fig. 2-8-B.

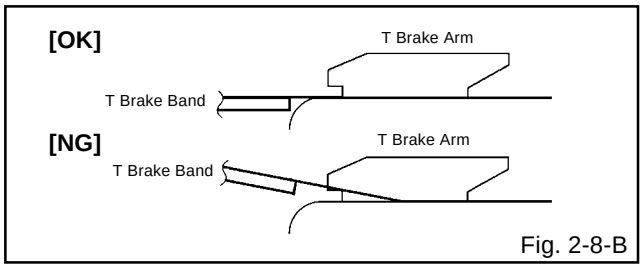


Fig. 2-8-B

2-9: S REEL/T REEL/IDLER ARM ASS'Y/IDLER GEAR (Refer to Fig. 2-9-A)

1. Remove the S Reel and T Reel.
2. Remove the 2 Polyslider Washers ①.
3. Remove the Idler Arm Ass'y and Idler Gear.

NOTE

1. Take care not to damage the gears of the S Reel and T Reel.
2. The Polyslider Washer may be remained on the back of the reel.
3. Take care not to damage the shaft.
4. Do not touch the section "A" of S Reel and T Reel. (Use gloves.) **(Refer to Fig. 2-9-A)** Do not adhere the stains on it.
5. When you install the reel, clean the shaft and grease it. (If you do not grease, noise may be heard in FF/REW mode.)
6. After installing the reel, adjust the height of the reel. **(Refer to MECHANICAL ADJUSTMENT)**

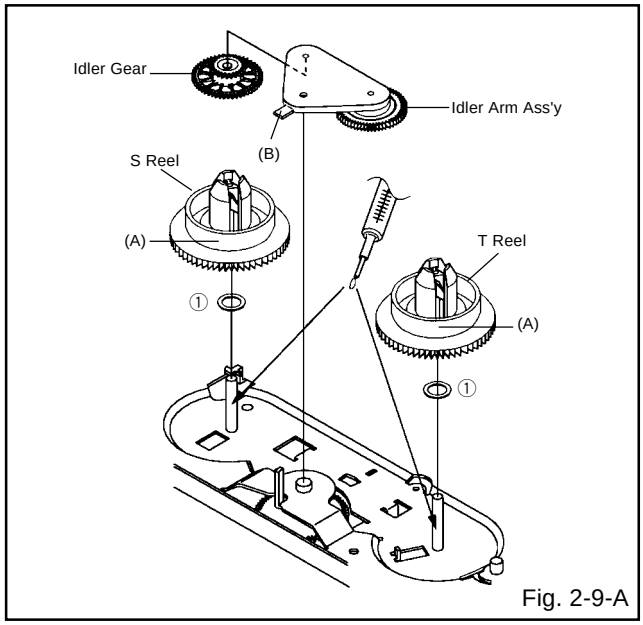


Fig. 2-9-A

NOTE

1. In case of the S Reel and T Reel installation, check if the correct parts are installed. **(Refer to Fig. 2-9-B)**
2. In case of the Idler Arm Ass'y installation, install correctly as Fig. 2-9-C. And also set it so that the section "B" of Fig. 2-9-A is placed under the Main Chassis tab.

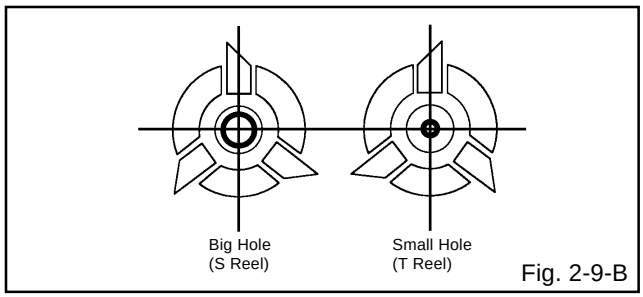


Fig. 2-9-B

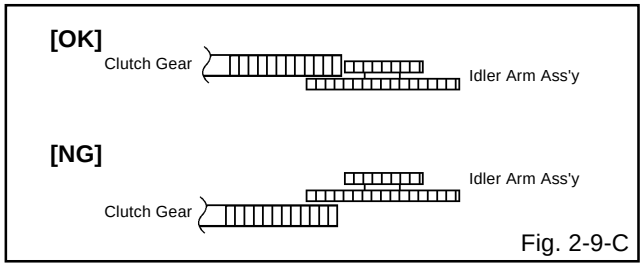


Fig. 2-9-C

DISASSEMBLY INSTRUCTIONS

2-10: CASSETTE OPENER/PINCH ROLLER BLOCK/ P5 ARM ASS'Y (Refer to Fig. 2-10-A)

1. Unlock the support ① and remove the Cassette Opener.
2. Remove the Pinch Roller Block and P5 Arm Ass'y.

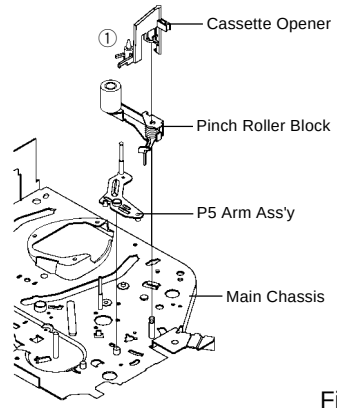


Fig. 2-10-A

NOTE

1. Do not touch the Pinch Roller. (Use gloves.)
2. In case of the Pinch Roller Block and the Pinch Roller Cam installation, install correctly as Fig. 2-10-B.

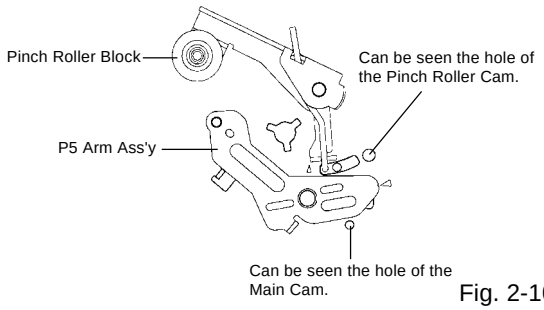


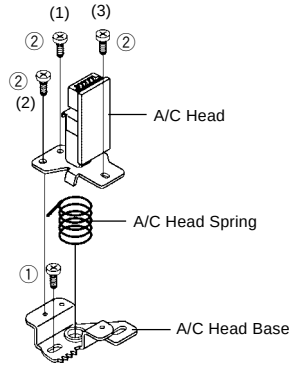
Fig. 2-10-B

2-11: A/C HEAD (Refer to Fig. 2-11-A)

1. Remove the screw ①.
2. Remove the A/C Head Base.
3. Remove the 3 screws ②.
4. Remove the A/C Head and A/C Head Spring.

NOTE

1. Do not touch the A/C Head. (Use gloves.)
2. When you install the A/C Head Spring, install as shown in Fig. 2-11-B.
3. When you install the A/C Head, tighten the screw (1) first, then tighten the screw (2), finally tighten the screw (3).



• Screw Torque: 5 ± 0.5kgf•cm (Screw ①)

Fig. 2-11-A

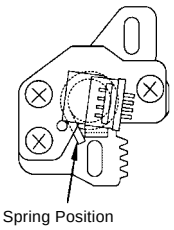
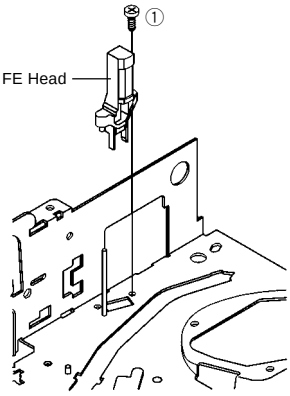


Fig. 2-11-B

2-12: FE HEAD (RECORDER ONLY) (Refer to Fig. 2-12)

1. Remove the screw ①.
2. Remove the FE Head.



• Screw Torque: 5 ± 0.5kgf•cm
• The FE Head is not installed on the Video Cassette Player.

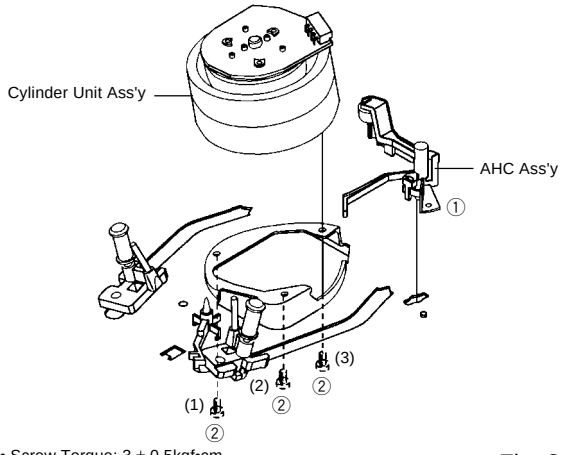
Fig. 2-12

2-13: AHC ASS'Y/CYLINDER UNIT ASS'Y (Refer to Fig. 2-13)

1. Unlock the support ① and remove the AHC Ass'y.
2. Disconnect the following connector: (CD2001)
3. Remove the 3 screws ②.
4. Remove the Cylinder Unit Ass'y.

NOTE

1. When you install the Cylinder Unit Ass'y, tighten the screws from (1) to (3) in order while pulling the Ass'y toward the left front direction.



• Screw Torque: 3 ± 0.5kgf•cm

Fig. 2-13

DISASSEMBLY INSTRUCTIONS

2-14: CAPSTAN DD UNIT (Refer to Fig. 2-14-A)

1. Remove the Capstan Belt.
2. Remove the 3 screws ①.
3. Remove the Capstan DD Unit.

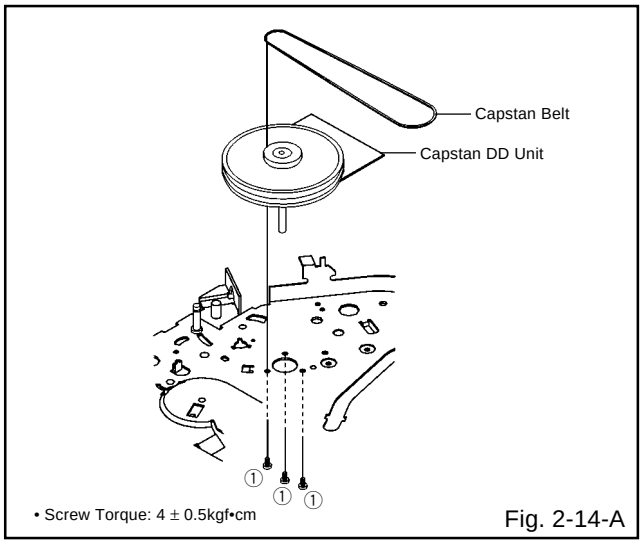


Fig. 2-14-A

NOTE

1. In case of the Capstan DD Unit installation, apply the silicon bond (TSE3843-W) on the position Fig. 2-14-B correctly. (If no silicon bond applied, abnormal noise will be heard on the deck operation.) **(Refer to Fig. 2-14-B, C)**

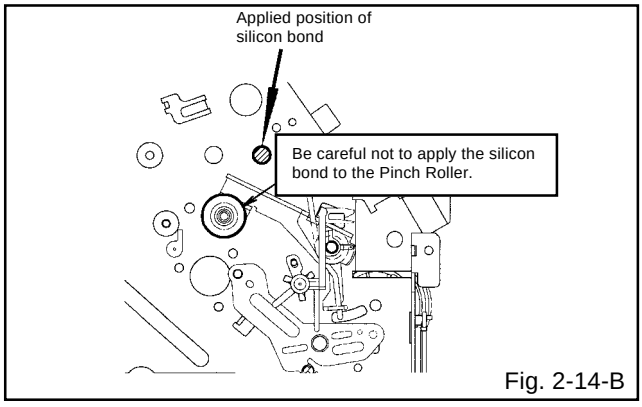


Fig. 2-14-B

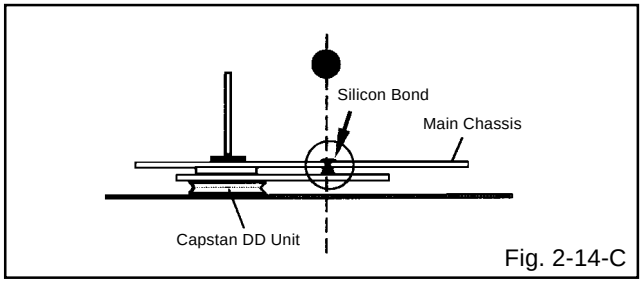


Fig. 2-14-C

2-15: MAIN CAM/PINCH ROLLER CAM/JOINT GEAR (Refer to Fig. 2-15-A)

1. Remove the E-Ring ①, then remove the Main Cam.
2. Remove the E-Ring ②, then remove the Pinch Roller Cam and Joint Gear.

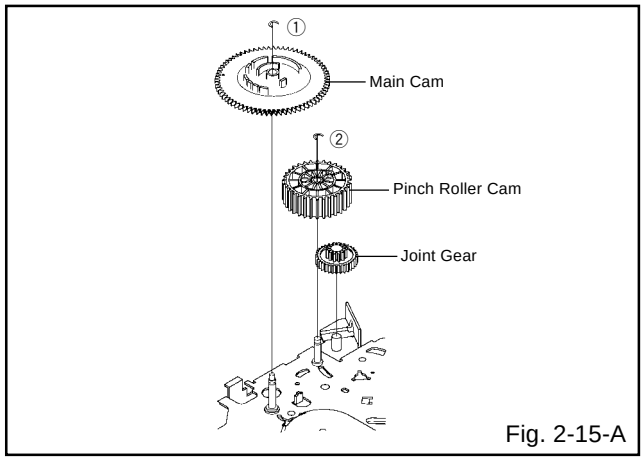


Fig. 2-15-A

NOTE

1. In case of the Pinch Roller Cam and Main Cam installation, install them as the circled section of Fig. 2-15-B so that the each markers are met. **(Refer to Fig. 2-15-B)**

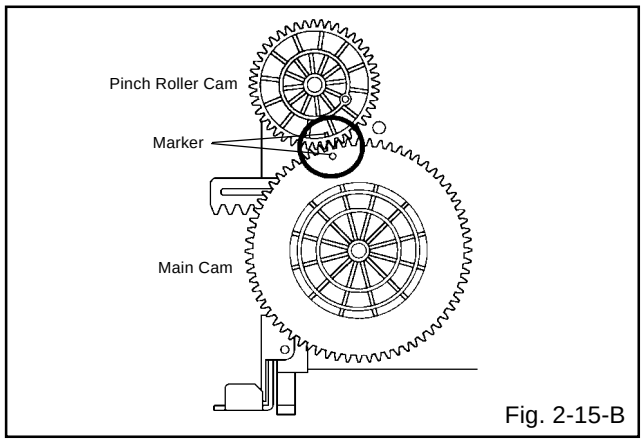


Fig. 2-15-B

2-16: LOADING GEAR S/T UNIT (Refer to Fig. 2-16-A)

1. Remove the E-Ring ① and remove the Main Loading Gear.
2. Remove the Main Rod, Tension Lever, Loading Arm S Unit and Loading Arm T Unit.

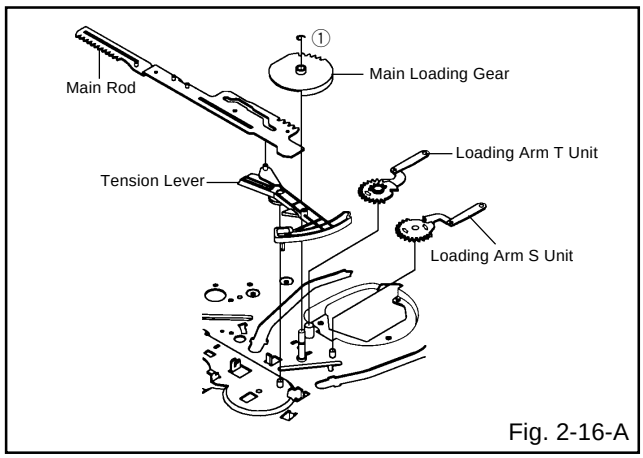


Fig. 2-16-A

DISASSEMBLY INSTRUCTIONS

NOTE

1. When you install the Loading Arm S Unit, Loading Arm T Unit and Main Loading Gear, align each marker. **(Refer to Fig. 2-16-B)**

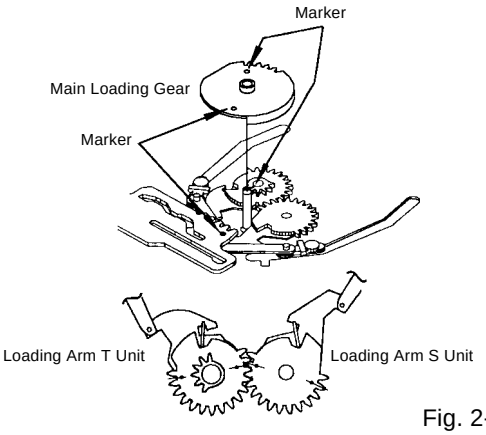


Fig. 2-16-B

2-17: CLUTCH ASS'Y/RING SPRING/CLUTCH LEVER/ CLUTCH GEAR (Refer to Fig. 2-17-A)

1. Remove the Polyslider Washer ①.
2. Remove the Clutch Ass'y and Ring Spring.
3. Remove the Clutch Lever.
4. Remove the Coupling Gear, Coupling Spring and Clutch Gear.

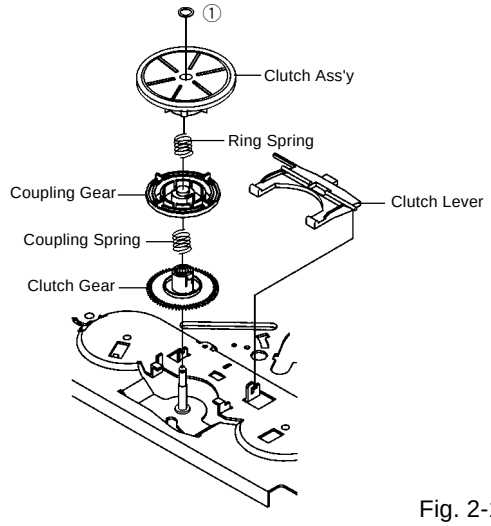


Fig. 2-17-A

NOTE

1. In case of the Clutch Ass'y installation, install it with inserting the spring of the Clutch Ass'y into the dent of the Coupling Gear. **(Refer to Fig. 2-17-B)**

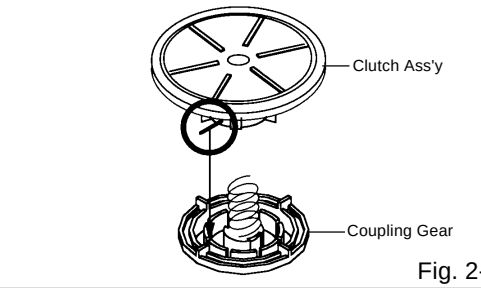


Fig. 2-17-B

2-18: CASSETTE GUIDE POST/INCLINED BASE S/T UNIT/P4 CAP (Refer to Fig. 2-18-A)

1. Remove the P4 Cap.
2. Unlock the support ① and remove the Cassette Guide Post.
3. Remove the Inclined Base S Unit and Inclined Base T Unit.

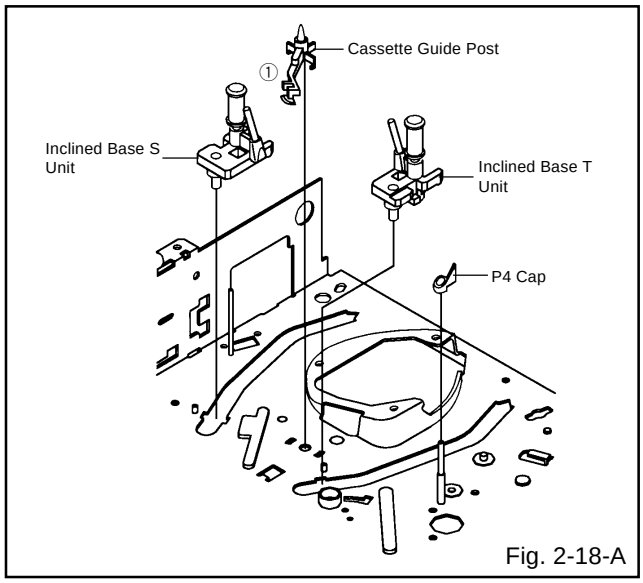


Fig. 2-18-A

NOTE

1. Do not touch the roller of Guide Roller.
2. In case of the P4 Cap installation, install it with parallel for "A" and "B" of Fig. 2-18-B.
3. In case of the Cassette Guide Post installation, install correctly as the circled section of Fig. 2-18-C.

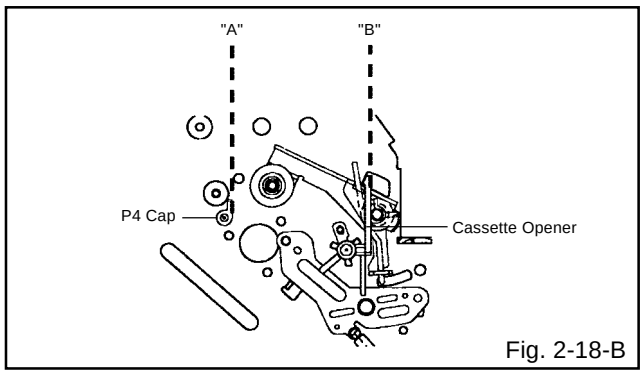


Fig. 2-18-B

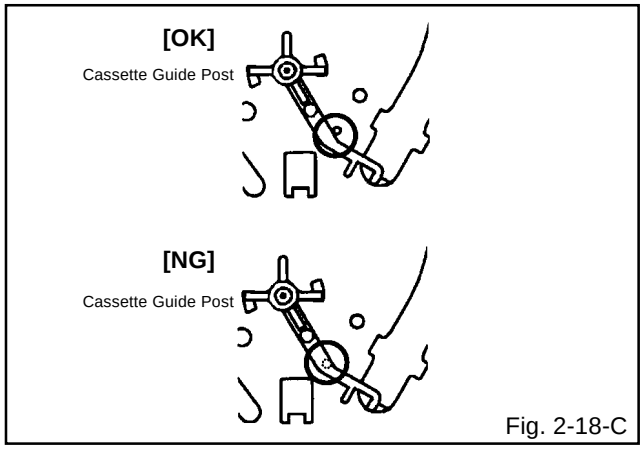


Fig. 2-18-C

DISASSEMBLY INSTRUCTIONS

3. REMOVAL OF ANODE CAP

Read the following **NOTED** items before starting work.

* After turning the power off there might still be a potential voltage that is very dangerous. When removing the Anode Cap, make sure to discharge the Anode Cap's potential voltage.
* Do not use pliers to loosen or tighten the Anode Cap terminal, this may cause the spring to be damaged.

REMOVAL

1. Follow the steps as follows to discharge the Anode Cap. **(Refer to Fig. 3-1.)**
   Connect one end of an Alligator Clip to the metal part of a flat-blade screwdriver and the other end to ground.
   While holding the plastic part of the insulated Screwdriver, touch the support of the Anode with the tip of the Screwdriver.
   A cracking noise will be heard as the voltage is discharged.

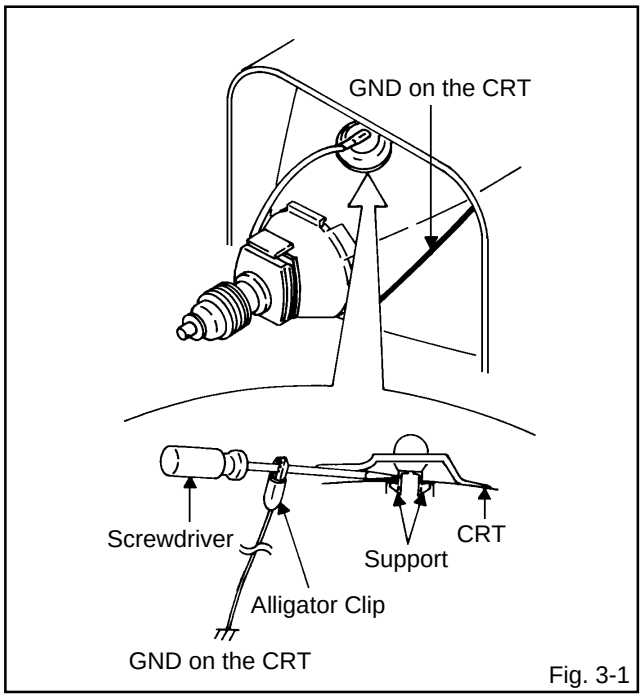


Fig. 3-1

2. Flip up the sides of the Rubber Cap in the direction of the arrow and remove one side of the support. **(Refer to Fig. 3-2.)**

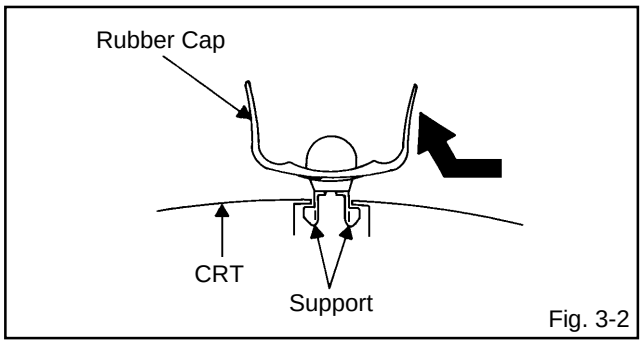


Fig. 3-2

3. After one side is removed, pull in the opposite direction to remove the other.

NOTE

Take care not to damage the Rubber Cap.

INSTALLATION

1. Clean the spot where the cap was located with a small amount of alcohol. **(Refer to Fig. 3-3.)**

NOTE

Confirm that there is no dirt, dust, etc. at the spot where the cap was located.

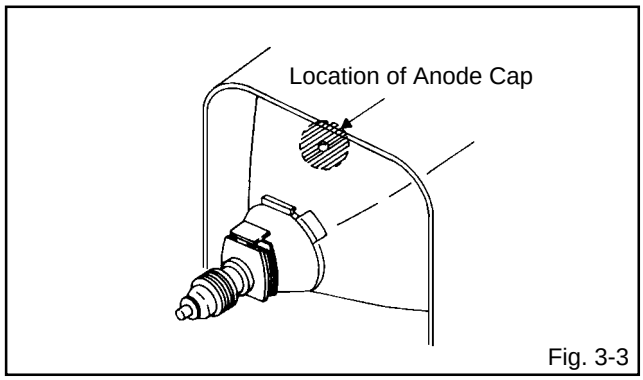


Fig. 3-3

2. Arrange the wire of the Anode Cap and make sure the wire is not twisted.
3. Turn over the Rubber Cap. **(Refer to Fig. 3-4.)**

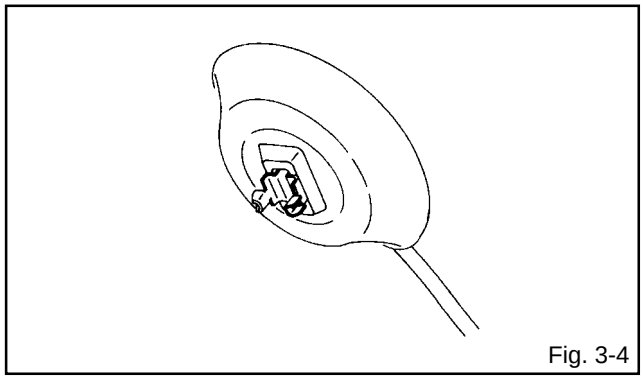


Fig. 3-4

4. Insert one end of the Anode Support into the anode button, then the other as shown in **Fig. 3-5**.

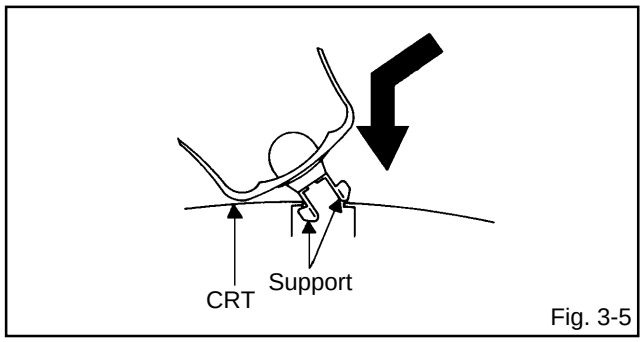


Fig. 3-5

5. Confirm that the Support is securely connected.
6. Put on the Rubber Cap without moving any parts.

DISASSEMBLY INSTRUCTIONS

4. REMOVAL AND INSTALLATION OF FLAT PACKAGE IC

REMOVAL

1. Put the Masking Tape (cotton tape) around the Flat Package IC to protect other parts from any damage. **(Refer to Fig. 4-1.)**

   NOTE

   Masking is carried out on all the parts located within 10 mm distance from IC leads.

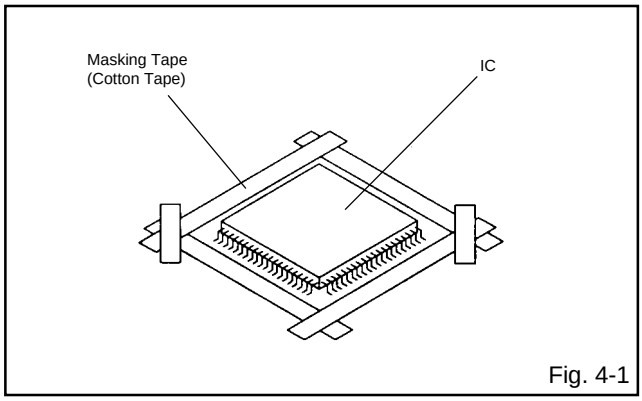


Fig. 4-1

2. Heat the IC leads using a blower type IC desoldering machine. **(Refer to Fig. 4-2.)**

   NOTE

   Do not add the rotating and the back and forth directions force on the IC, until IC can move back and forth easily after desoldering the IC leads completely.

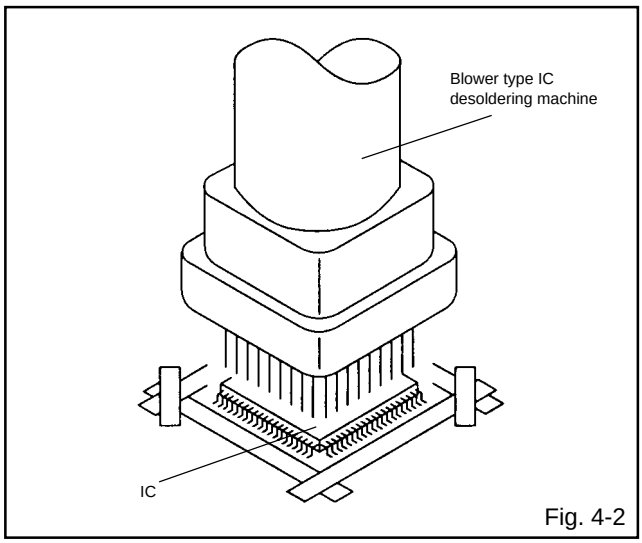


Fig. 4-2

3. When IC starts moving back and forth easily after desoldering completely, pickup the corner of the IC using a tweezers and remove the IC by moving with the IC desoldering machine. **(Refer to Fig. 4-3.)**

   NOTE

   Some ICs on the PCB are affixed with glue, so be careful not to break or damage the foil of each IC leads or solder lands under the IC when removing it.

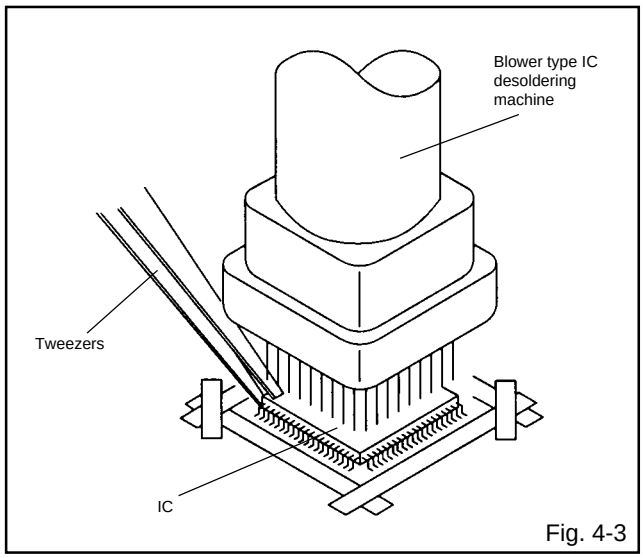


Fig. 4-3

4. Peel off the Masking Tape.

5. Absorb the solder left on the pattern using the Braided Shield Wire. **(Refer to Fig. 4-4.)**

   NOTE

   Do not move the Braided Shield Wire in the vertical direction towards the IC pattern.

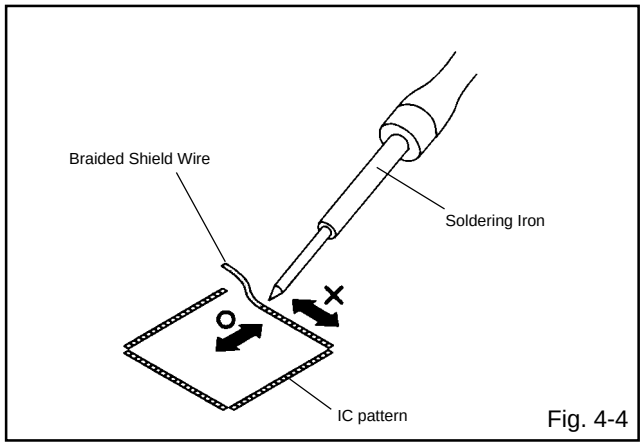


Fig. 4-4

DISASSEMBLY INSTRUCTIONS

INSTALLATION

1. Take care of the polarity of new IC and then install the new IC fitting on the printed circuit pattern. Then solder each lead on the diagonal positions of IC temporarily. **(Refer to Fig. 4-5.)**

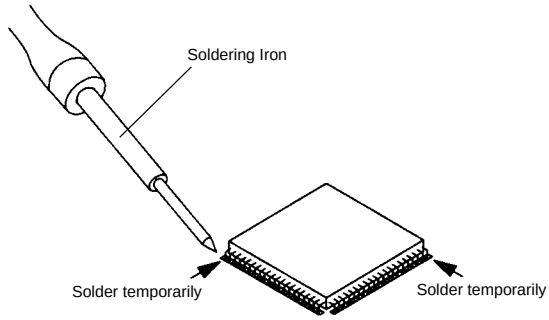


Fig. 4-5

2. Supply the solder from the upper position of IC leads sliding to the lower position of the IC leads. **(Refer to Fig. 4-6.)**

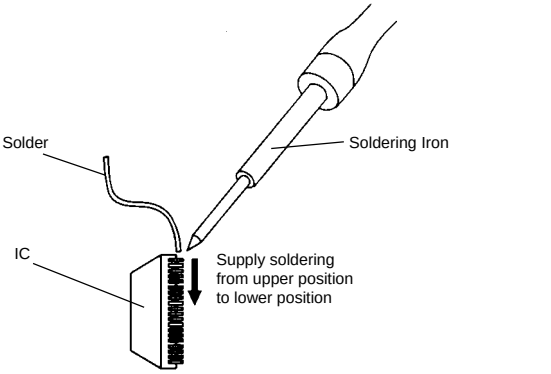


Fig. 4-6

3. Absorb the solder left on the lead using the Braided Shield Wire. **(Refer to Fig. 4-7.)**

   NOTE

   Do not absorb the solder to excess.

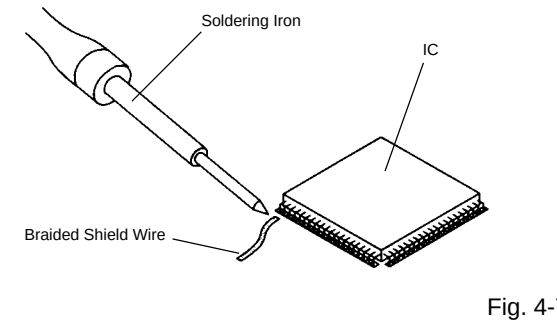


Fig. 4-7

4. When bridge-soldering between terminals and/or the soldering amount are not enough, resolder using a Thin-tip Soldering Iron. **(Refer to Fig. 4-8.)**

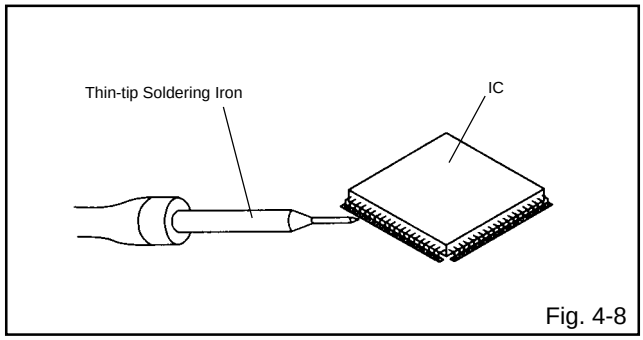


Fig. 4-8

5. Finally, confirm the soldering status on four sides of the IC using a magnifying glass.
   Confirm that no abnormality is found on the soldering position and installation position of the parts around the IC. If some abnormality is found, correct by resoldering.

   NOTE

   When the IC leads are bent during soldering and/or repairing, do not repair the bending of leads. If the bending of leads are repaired, the pattern may be damaged. So, be always sure to replace the IC in this case.

KEY TO ABBREVIATIONS

A	**A/C**	:	Audio/Control
	ACC	:	Automatic Color Control
	AE	:	Audio Erase
	AFC	:	Automatic Frequency Control
	AFT	:	Automatic Fine Tuning
	AFT DET	:	Automatic Fine Tuning Detect
	AGC	:	Automatic Gain Control
	AMP	:	Amplifier
	ANT	:	Antenna
	A.PB	:	Audio Playback
	APC	:	Automatic Phase Control
	ASS'Y	:	Assembly
	AT	:	All Time
	AUTO	:	Automatic
	A/V	:	Audio/Video
B	**BGP**	:	Burst Gate Pulse
	BOT	:	Beginning of Tape
	BPF	:	Bandpass Filter
	BRAKE SOL	:	Brake Solenoid
	BUFF	:	Buffer
	B/W	:	Black and White
C	**C**	:	Capacitance, Collector
	CASE	:	Cassette
	CAP	:	Capstan
	CARR	:	Carrier
	CH	:	Channel
	CLK	:	Clock
	CLOCK (SY-SE)	:	Clock (Syscon to Servo)
	COMB	:	Combination, Comb Filter
	CONV	:	Converter
	CPM	:	Capstan Motor
	CTL	:	Control
	CYL	:	Cylinder
	CYL-M	:	Cylinder-Motor
	CYL SENS	:	Cylinder-Sensor
D	**DATA (SY-CE)**	:	Data (Syscon to Servo)
	dB	:	Decibel
	DC	:	Direct Current
	DD Unit	:	Direct Drive Motor Unit
	DEMOD	:	Demodulator
	DET	:	Detector
	DEV	:	Deviation
E	**E**	:	Emitter
	EF	:	Emitter Follower
	EMPH	:	Emphasis
	ENC	:	Encoder
	ENV	:	Envelope
	EOT	:	End of Tape
	EQ	:	Equalizer
	EXT	:	External
F	**F**	:	Fuse
	FBC	:	Feed Back Clamp
	FE	:	Full Erase
	FF	:	Fast Forward, Flip-flop
	FG	:	Frequency Generator
	FL SW	:	Front Loading Switch
	FM	:	Frequency Modulation
	FSC	:	Frequency Sub Carrier
	FWD	:	Forward
G	**GEN**	:	Generator
	GND	:	Ground
H	**H.P.F**	:	High Pass Filter
	H.SW	:	Head Switch
	Hz	:	Hertz
I	**IC**	:	Integrated Circuit
	IF	:	Intermediate Frequency
	IND	:	Indicator
	INV	:	Inverter
K	**KIL**	:	Killer
L	**L**	:	Left
	LED	:	Light Emitting Diode
	LIMIT AMP	:	Limiter Amplifier
	LM, LDM	:	Loading Motor
	LP	:	Long Play
	L.P.F	:	Low Pass Filter
	LUMI.	:	Luminance
M	**M**	:	Motor
	MAX	:	Maximum
	MINI	:	Minimum
	MIX	:	Mixer, mixing
	MM	:	Monostable Multivibrator
	MOD	:	Modulator, Modulation
	MPX	:	Multiplexer, Multiplex
	MS SW	:	Mecha State Switch
N	**NC**	:	Non Connection
	NR	:	Noise Reduction
O	**OSC**	:	Oscillator
	OPE	:	Operation
P	**PB**	:	Playback
	PB CTL	:	Playback Control
	PB-C	:	Playback-Chrominance
	PB-Y	:	Playback-Luminance
	PCB	:	Printed Circuit Board
	P. CON	:	Power Control
	PD	:	Phase Detector
	PG	:	Pulse Generator
	P-P	:	Peak-to Peak
R	**R**	:	Right
	REC	:	Recording
	REC-C	:	Recording-Chrominance
	REC-Y	:	Recording-Luminance
	REEL BRK	:	Reel Brake
	REEL S	:	Reel Sensor
	REF	:	Reference
	REG	:	Regulated, Regulator
	REW	:	Rewind
	REV, RVS	:	Reverse
	RF	:	Radio Frequency
	RMC	:	Remote Control
	RY	:	Relay
S	**S. CLK**	:	Serial Clock
	S. COM	:	Sensor Common
	S. DATA	:	Serial Data
	SEG	:	Segment
	SEL	:	Select, Selector
	SENS	:	Sensor
	SER	:	Search Mode
	SI	:	Serial Input
	SIF	:	Sound Intermediate Frequency
	SO	:	Serial Output
	SOL	:	Solenoid
	SP	:	Standard Play
	STB	:	Serial Strobe
	SW	:	Switch

KEY TO ABBREVIATIONS

S	**SYNC**	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	**TR**	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	**UNREG**	:	Unregulated
V	**V**	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	**X'TAL**	:	Crystal
Y	**Y/C**	:	Luminance/Chrominance

SERVICE MODE LIST

This unit provided with the following SERVICE MODES so you can repair, examine and adjust easily.

To enter to the SERVICE MODE function, press and hold both buttons simultaneously on the main unit or on the main unit and on the remote control for more than a standard time (second).

The both pressing of main unit key and remote control key will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

Set Key	Remocon Key	Standard Time (seconds)	Operations
VOL. (-) MIN	0	2	Releasing of V-CHIP PASSWORD.
VOL. (-) MIN	1	2	Initialization of the factory on TV/VCR. NOTE: Do not use this for the normal servicing. If you set a factory initialization, the memories are reset such as the clock setting, the channel setting, the POWER ON total hours, and PLAY/REC total hours.
VOL. (-) MIN	2	2	Horizontal position adjustment of OSD. NOTE: Also can be adjusted by using the Adjustment MENU. Refer to the "ELECTRICAL ADJUSTMENT" (OSD HORIZONTAL).
VOL. (-) MIN	3	2	Adjust the PG SHIFTER automatically. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	4	2	Adjust the PG SHIFTER manually. Refer to the "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	5	2	Adjusting of the Tracking to the center position. Refer to the "MECHANICAL ADJUSTMENT" (GUIDE ROLLER) and "ELECTRICAL ADJUSTMENT" (PG SHIFTER).
VOL. (-) MIN	6	2	POWER ON total hours and PLAY/REC total hours are displayed on the screen. Refer to the "PREVENTIVE CHECKS AND SERVICE INTERVALS" (CONFIRMATION OF HOURS USED). Can be checked of the INITIAL DATA of MEMORY IC. Refer to the "WHEN REPLACING EEPROM (MEMORY) IC".
VOL. (-) MIN	9	2	Display of the Adjustment MENU on the screen. Refer to the "ELECTRICAL ADJUSTMENT" (On-Screen Display Adjustment).
REC/OTR	4	2	Initialization of the factory on DVD. NOTE: Do not use this for the normal servicing. The function will only work without the setting of DVD disc at DVD mode. While pressing the Remocon Key for more than the Standard Time, press the Set Key simultaneously.
STOP	7	3	Releasing of PARENTAL LOCK. Refer to the “PARENTAL CONTROL - RATING LEVEL”. NOTE: The function will only work without the setting of DVD disc at DVD mode.

Method	Operations
Make the short circuit between the test point of SERVICE and the GND.	The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape. Refer to the “PREPARATION FOR SERVICING”

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage.
Parts replacing time does not mean the life span for individual parts.
Also, long term storage or misuse may cause transformation and aging of rubber parts.
The following list means standard hours, so the checking hours depends on the conditions.

Time / Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	2,500 hours	Notes
Audio Control Head	■	■	■	●	●	Clean those parts in contact with the tape.
Full Erase Head (Recorder only)	■	■	■	●	●	
Capstan Belt		●	●	●	●	Clean the rubber, and parts which the rubber touches.
Pinch Roller	■	●	●	●	●	
Capstan DD Unit		●	●	●	●	
Loading Motor					●	
Tension Band		●	●	●	●	
T Brake Band		●	●	●	●	
Clutch Ass'y		●	●	●	●	
Idler Arm Ass'y		●	●	●	●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	●	●	●	●	Clean the Head

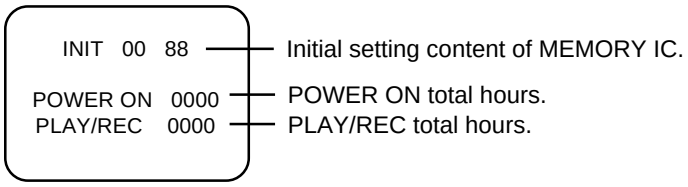
■ : Clean
● : Check it and if necessary, replace it.

CONFIRMATION OF HOURS USED

POWER ON total hours and PLAY/REC total hours can be checked on the screen.
Total hours are displayed in 16 system of notation.

NOTE: If you set a factory initialization, the total hours is reset to "0".
The confirmation of using hours will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

1. Set the VOLUME to minimum.
2. Press both VOL. DOWN button on the set and the Channel button **(6)** on the remote control for more than 2 seconds.
3. After the confirmation of using hours, turn off the power.



(16 x 16 x 16 x thousands digit value) + (16 x 16 x hundreds digit value) + (16 x tens digit value) + (ones digit value)

PREVENTIVE CHECKS AND SERVICE INTERVALS

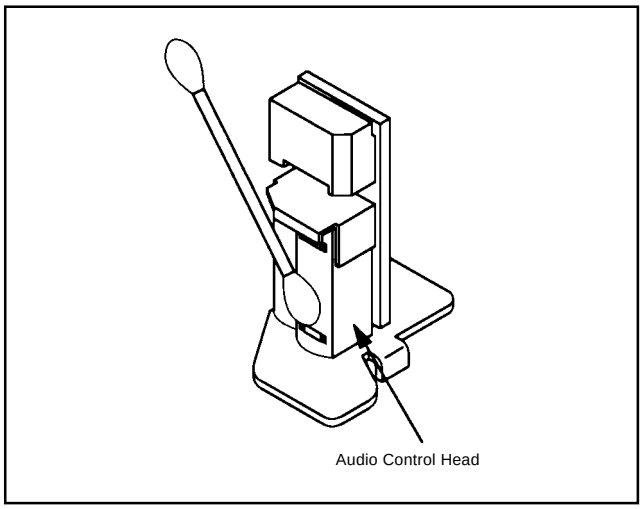
CLEANING

NOTE

After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

Clean the Audio Control Head with the cotton stick soaked by alcohol. Clean the full erase head in the same manner. **(Refer to the figure below.)**



2. TAPE RUNNING SYSTEM

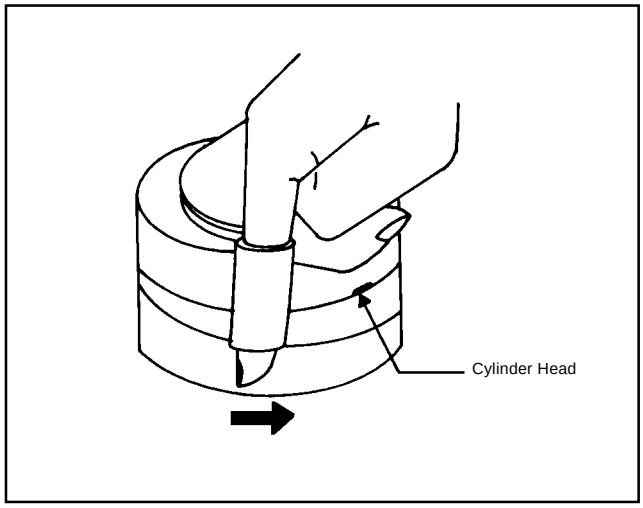
When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below.)**

NOTE

Do not exert force against the cylinder head. Do not move the chamois upward or downward on the head.
Use the chamois one by one.



WHEN REPLACING EEPROM (MEMORY) IC

If a service repair is undertaken where it has been required to change the MEMORY IC, the following steps should be taken to ensure correct data settings while making reference to TABLE 1.

NOTE: Initial Data setting will not be possible if clock has been set. To reset clock, either unplug AC cord and allow at least 5 seconds before Power On.

INI	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9	+A	+B	+C	+D	+E	+F
00	8D	4F	70	00	49	05	FF	62	86	45	90	88	07	A0	00	24
10	40	0F	E3	52	03	87	00	48	00	FF	19	3A	1E	54	0A	B8
20	9F	97	91	A5	B0	B0	01	BA	1A	0B	3D	01	25	06	14	70
30	00	31	09	14	02	7F	0E	FF	FF	FF	FF	FF	FF	FF	FF	FF
40	62	45	26	07	67	48	09	49	0A	4A	6A	4B	6B	4C	6C	4D
50	6D	4E	6E	4F	6F	50	70	51	71	52	72	53	73	54	74	55
60	75	56	76	57	77	58	78	59	79	5A	7A	7A	5B	5B	7B	7B
70	5C	5C	7C	7C	5D	5D	7D	7D	5E	5E	7E	7E	5F	5F	7F	7F

Table 1

1. Enter DATA SET mode by setting VOLUME to minimum.
2. While holding down VOLUME button on front cabinet, press key 6 on remote control for more than 2 seconds. ADDRESS and DATA should appear as FIG 1.

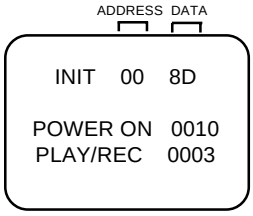
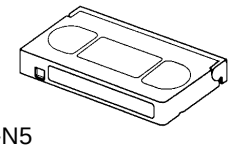
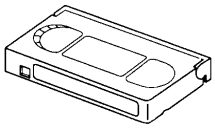
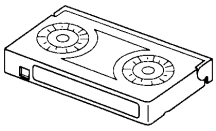
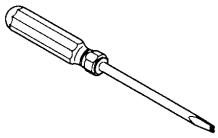
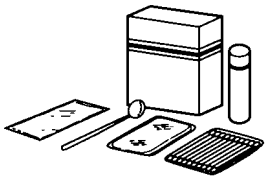
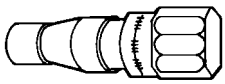
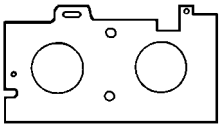
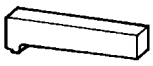
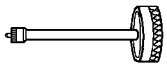
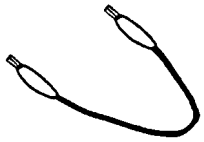
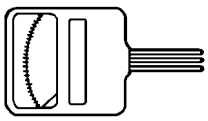


Fig. 1

3. ADDRESS is now selected and should "blink". Using the UP or DOWN button on the remote, step through the ADDRESS until required ADDRESS to be changed is reached.
4. Press ENTER to select DATA. When DATA is selected, it will "blink".
5. Again, step through the DATA using UP or DOWN button until required DATA value has been selected.
6. Pressing ENTER will take you back to ADDRESS for further selection if necessary.
7. Repeat steps 3 to 6 until all data has been checked.
8. When satisfied correct DATA has been entered, turn POWER off (return to STANDBY MODE) to finish DATA input.

The unit will now have the correct DATA for the new MEMORY IC.

SERVICING FIXTURES AND TOOLS

Alignment Tape  ST-N5 ST-NF	Back tension cassette gauge  70909103	Torque cassette gauge (KT-300NR)  70909199	Taper nut driver  70909228
VTR cleaning kit 	VTR lubrication kit 	Grease 	JG002B Adapter JG002E Dial Torque Gauge (10~90gf•cm) JG002F (60~600gf•cm) 
JG022 Master Plane 	JG024A Reel Disk Height Adjustment Jig 	JG153 X Value Adjustment Screwdriver 	JG154 Cable 
Tentelometer 			

Ref. No.	Part No.	Parts Name	Remarks
JG002B	APJG002B00	Adapter	VSR Torque, Brake Torque (S Reel/T Reel Ass'y)
JG002E	APJG002E00	Dial Torque Gauge (10~90gf•cm)	Brake Torque (T Reel Ass'y)
JG002F	APJG002F00	Dial Torque Gauge (60~600gf•cm)	VSR Torque, Brake Torque (S Reel)
JG022	APJG022000	Master Plane	Reel Disk Height Adjustment
JG024A	APJG024A00	Reel Disk Height Adjustment Jig	Reel Disk Height Adjustment
JG153	APJG153000	X Value Adjustment Screwdriver	X Value Adjustment
JG154	APJG154000	Cable	Used to connect the test point of SERVICE and GROUND

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Remove the TV/VCR/DVD block from the set.
   Be sure to place the parts on a paper so that they have no short-circuit each other.
2. Short circuit between **TP101** and **Ground** with the cable JG154.
   (The BOT, EOT, and the Reel Sensor do not work and the VCR deck can be operated without a cassette tape.)
3. In case of using a cassette tape, press the STOP/EJECT button to insert or eject a cassette tape.
   Turn on the power and re-check the cable before checking the trouble points.

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTES before starting work.

- Place an object which weighs between 450g~500g on the Cassette Tape to keep it steady when you want to make the tape run without the Cassette Holder. (Do not place an object which weighs over 500g.)

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane **(JG022)** and reel disk height adjustment jig **(JG024A)** on the mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
3. While turning the reel and confirm the following points. Check if the surface "A" of reel disk is lower than the surface "B" of reel disk height adjustment jig **(JG024A)** and is higher than the surface "C". If it is not passed, place the height adjustment washers and adjust to 10(+2, -0)mm.
4. Adjust the other reel in the same way.

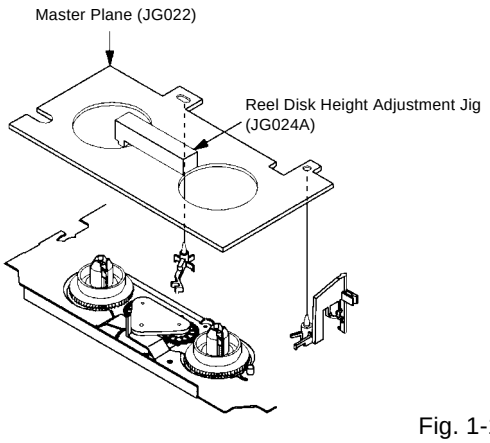


Fig. 1-1-A

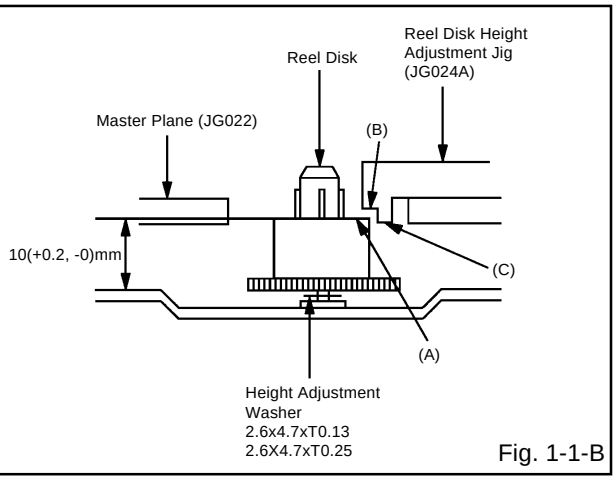


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Set to the PLAY mode.
2. Adjust the adjusting section for the Tension Arm position so that the Tension Arm top is within the standard line of Main Chassis.
3. While turning the S Reel clockwise, confirm that the edge of the Tension Arm is located in the position described above.

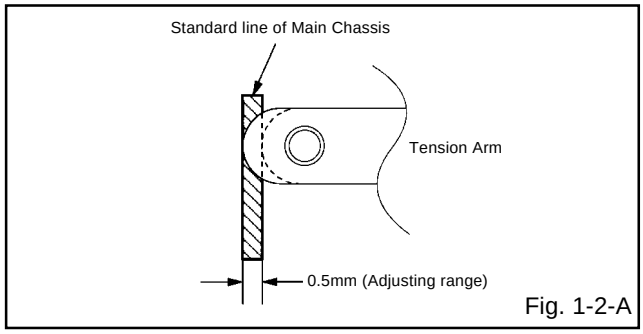


Fig. 1-2-A

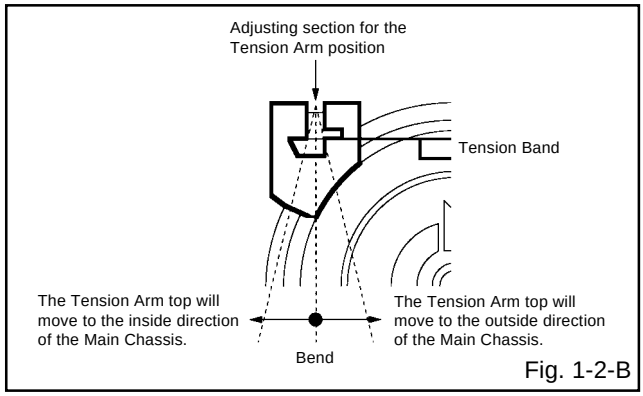


Fig. 1-2-B

1-3: CONFIRMATION OF PLAYBACK TORQUE AND BACK TENSION TORQUE DURING PLAYBACK

1. Load a video tape (T-120) recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3**. Confirm that the meter indicates 20 ± 2gf in the beginning of playback.

• USING A CASSETTE TYPE TORQUE TAPE **(KT-300NR)**

1. After confirmation and adjustment of Tension Post position **(Refer to item 1-2)**, load the cassette type torque tape **(KT-300NR)** and set to the PLAY mode.
2. Confirm that the right meter of the torque tape indicates 50~90gf•cm during playback in SP mode.
3. Confirm that the left meter of the torque tape indicates 25~40gf•cm during playback in SP mode.

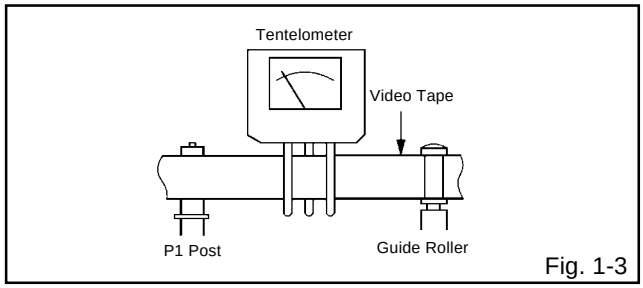


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF VSR TORQUE

1. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Set to the Picture Search (Rewind) mode. **(Refer to Fig.1-4-B)**
2. Then, confirm that it indicates 120~180gf•cm.

NOTE

Install the Torque Gauge on the reel disk firmly. Press the REW button to turn the reel disk.

1-5: CONFIRMATION OF REEL BRAKE TORQUE

(S Reel Brake) **(Refer to Fig. 1-4-B)**

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A**.
2. Move the Idler Ass'y from the S Reel.
3. Install the Torque Gauge **(JG002F)** and Adapter **(JG002B)** on the S Reel. Turn the Torque Gauge **(JG002F)** clockwise.
4. Then, confirm that it indicates 60~100gf•cm.

(T Reel Brake) **(Refer to Fig. 1-4-B)**

1. Once set to the Fast Forward mode then set to the Stop mode. While, unplug the AC cord when the Pinch Roller Block is on the position of **Fig. 1-4-A**.
2. Move the Idler Ass'y from the T Reel.
3. Install the Torque Gauge **(JG002E)** and Adapter **(JG002B)** on the T reel. Turn the Torque Gauge **(JG002E)** counterclockwise.
4. Then, confirm that it indicates 30~50gf•cm.

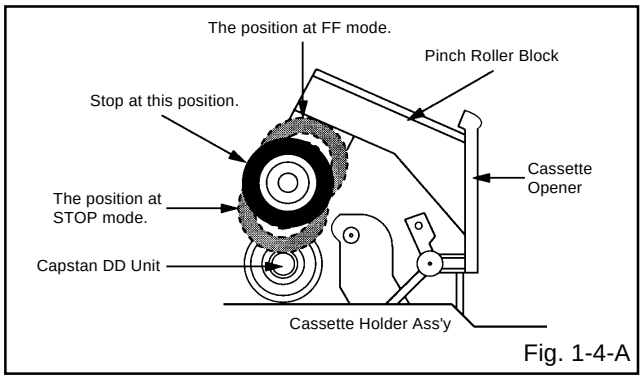


Fig. 1-4-A

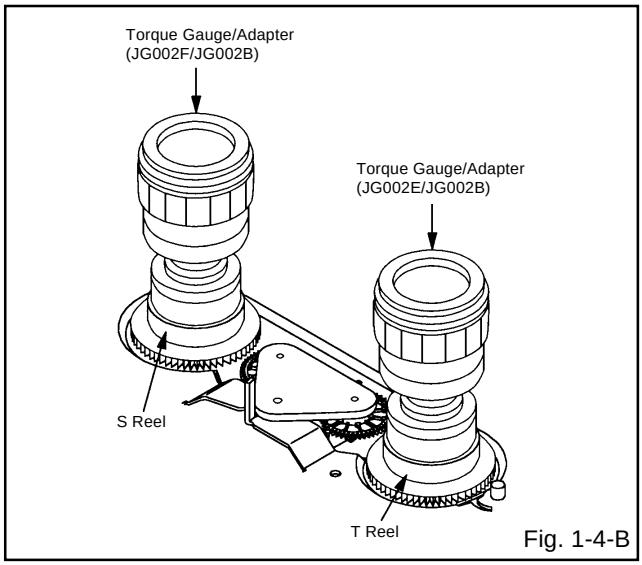


Fig. 1-4-B

NOTE

If the torque is out of the range, replace the following parts.

Check item	Replacement Part
1-4	Idler Ass'y/Clutch Ass'y
1-5	S Reel side: S Reel/Tension Band/Tension Connect/Tension Arm Ass'y T Reel side: T Reel/T Brake Band//T Brake Spring/T Brake Arm

2. CONFIRMATION AND ADJUSTMENT OF TAPE RUNNING MECHANISM

Tape Running Mechanism is adjusted precisely at the factory. Adjustment is not necessary as usual. When you replace the parts of the tape running mechanism because of long term usage or failure, the confirmation and adjustment are necessary.

2-1: GUIDE ROLLER

1. Playback the VHS Alignment Tape.
2. Connect CH-1 of the oscilloscope to **TP4501 (Envelope)** and CH-2 to **TP102 (SW Pulse)**.
3. Press both VOL. DOWN button on the set and the Channel button **(5)** on the remote control for more than 2 seconds.
4. Trigger with SW Pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
5. When observing the envelope, adjust the Taper Nut Driver slightly until the envelope will be flat. Even if you press the Tracking Button, adjust so that flatness is not moved so much.
6. Adjust so that the A : B ratio is better than 3 : 2 as shown in **Fig. 2-1-B**, even if you press the Tracking Button to move the envelope (The envelope waveform will begin to decrease when you press the Tracking Button).
7. Adjust the PG shifter during playback. **(Refer to the ELECTRICAL ADJUSTMENTS)**

NOTE

After adjustment, confirm and adjust A/C head. **(Refer to item 2-2)**

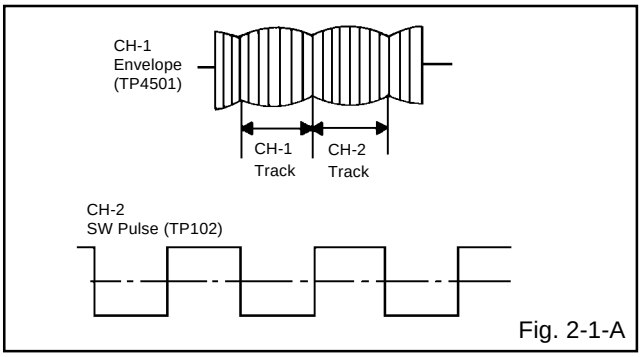


Fig. 2-1-A

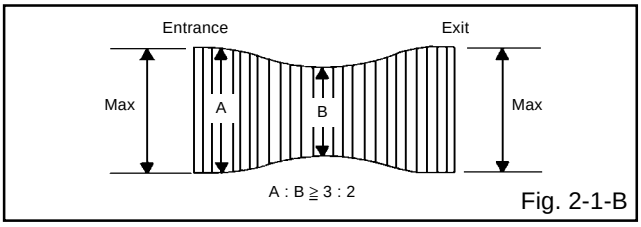


Fig. 2-1-B

MECHANICAL ADJUSTMENTS

2-2: CONFIRMATION AND ADJUSTMENT OF AUDIO/ CONTROL HEAD

When the Tape Running Mechanism does not work well, adjust the following items.

1. Playback the VHS Alignment Tape.
2. Confirm that the reflected picture of stamp mark is appeared on the tape prior to P4 Cap as shown in **Fig. 2-2-A**.
   a) When the reflected picture is distorted, turn the screw ① clockwise until the distortion is disappeared.
   b) When the reflected picture is not distorted, turn the screw ① counterclockwise until little distortion is appeared, then adjust the a).
3. Turn the screw ② to set the audio level to maximum.
4. Confirm that the bottom of the Audio/ Control Head and the bottom of the tape is shown in **Fig. 2-2-C**.
   c) When the height is not correct, turn the screw ③ to adjust the height. Then, adjust the 1~3 again.

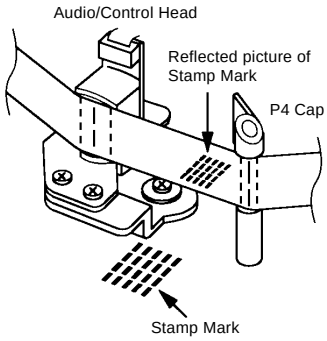


Fig. 2-2-A

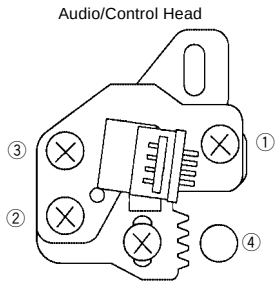


Fig. 2-2-B

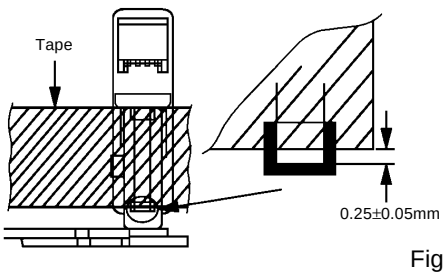


Fig. 2-2-C

2-3: TAPE RUNNING ADJUSTMENT (X VALUE ADJUSTMENT)

1. Confirm and adjust the height of the Reel Disk. **(Refer to item 1-1)**
2. Confirm and adjust the position of the Tension Post. **(Refer to item 1-2)**
3. Adjust the Guide Roller. **(Refer to item 2-1)**
4. Confirm and adjust the Audio/Control Head. **(Refer to item 2-2)**
5. Connect CH-1 of the oscilloscope to **TP102**, CH-2 to **TP4501** and CH-3 to **HOT side of Audio Out Jack**.
6. Playback the VHS Alignment Tape.
7. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
8. Set the X Value adjustment driver **(JG153)** to the ④ of **Fig. 2-2-B**. Adjust X value so that the envelope waveform output becomes maximum. Check if the relation between Audio and Envelope waveform becomes (1) or (2) of **Fig. 2-3**.

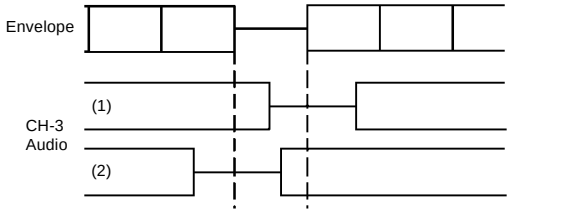


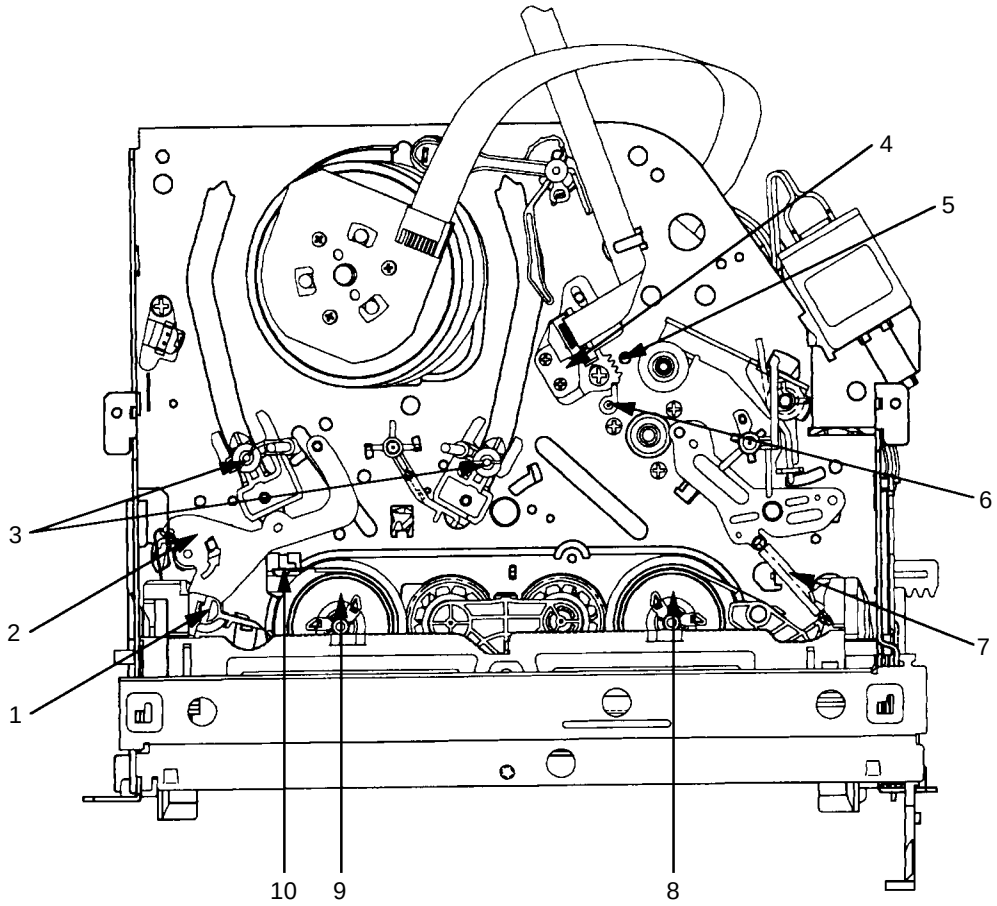
Fig. 2-3

2-4: CONFIRM HI-FI AUDIO (Hi-Fi model only)

1. Connect CH-1 of the oscilloscope to **TP4501** and CH-2 to the **Hi-Fi Audio Out Jack**.
2. Playback the VHS Alignment Tape. **(Refer to SERVICING FIXTURE AND TOOLS)**
3. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
4. Press the Tracking Up button and count number of steps which the audio output is changed from Hi-Fi (10KHz) to MONO (6KHz).
5. Press and hold the Tracking-Auto button on the remote control more than 2 seconds to set tracking to center.
6. Press the Tracking Down button and count number of steps which the audio output is changed from Hi-Fi (10KHz) to MONO (6KHz).
7. If the difference are more than 3 steps, set the X Value adjustment driver **(JG153)** to ④ of **Fig. 2-2-B**. Change the X Value and adjust it so that the value becomes within 2 steps.

MECHANICAL ADJUSTMENTS

3. MECHANISM ADJUSTMENT PARTS LOCATION GUIDE



1. Tension Connect
2. Tension Arm
3. Guide Roller
4. Audio/Control Head
5. X value adjustment driver hole
6. P4 Post
7. T Brake Spring
8. T Reel
9. S Reel
10. Adjusting section for the Tension Arm position

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

- Use an isolation transformer when performing any service on this chassis.
- Before removing the anode cap, discharge electricity because it contains high voltage.
- When removing a PCB or related component, after unfastening or changing a wire, be sure to put the wire back in its original position.
- When you exchange IC and Transistor for a heat sink, apply the silicon grease on the contact section of the heat sink. Before applying new silicon grease, remove all the old silicon grease. (Old grease may cause damages to the IC and Transistor).

Prepare the following measurement tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Multi-sound Generator
4. Pattern Generator

On-Screen Display Adjustment

1. Unplug the AC plug for more than 5 seconds to set the clock to the non-setting state. Then, set the volume level to minimum.
2. Press the VOL. DOWN button on the set and the Channel button **(9)** on the remote control for more than 2 seconds to appear the adjustment mode on the screen as shown in **Fig. 1-1**.

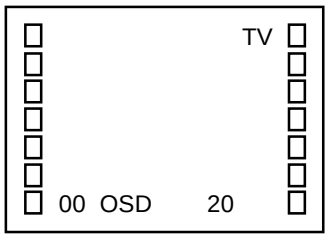


Fig. 1-1

3. Use the Channel UP/DOWN button or Channel button **(0-9)** on the remote control to select the options shown in **Fig. 1-2**.
4. Press the MENU button on the remote control to end the adjustments.

NO.	FUNCTION	NO.	FUNCTION
00	OSD H	19	SUB CONT
01	CUT OFF	20	UNI COL CENT
02	RF.AGC	21	UNI COL MAX
03	---	22	UNI COL MIN
04	H.POSI	23	COL CENT
05	V.POSI	24	COL MAX
06	H.SIZE	25	COL MIN
07	V.SIZE	26	TINT
08	V.CENT	27	SHARP
09	V.LIN	28	RGB CONT
10	VS.CORR	29	PARABOLA
11	G.DRV	30	TRAPEZIUM
12	B.DRV	31	COR TOP
13	R.BIAS	32	COR BTM
14	G.BIAS	33	V EHT
15	B.BIAS	34	H EHT
16	BRI CENT	35	FM.LVL
17	BRI MAX	36	T.STE
18	BRI MIN		

Fig. 1-2

2. BASIC ADJUSTMENTS (VCR SECTION)

2-1: PG SHIFTER

1. Connect CH-1 on the oscilloscope to **TP102** and CH-2 to **TP4201**.
2. Playback the alignment tape.
3. Press both VOL. DOWN button on the set and the Channel button **(5)** on the remote control for more than 2 seconds to set tracking to center.
4. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control for more than 2 seconds until the indicator REC disappears. If the indicator REC disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

5. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control for more than 2 seconds until the indicator REC disappears.
6. When the REC indicator is blinking, press both VOL. DOWN button on the set and the channel button **(4)** on the remote control for more than 2 seconds and adjust the Tracking +/- button until the arising to the down of Head Switching Pulse becomes 6.5 ± 0.5H.
   (Refer to Fig. 2-1-A, B)

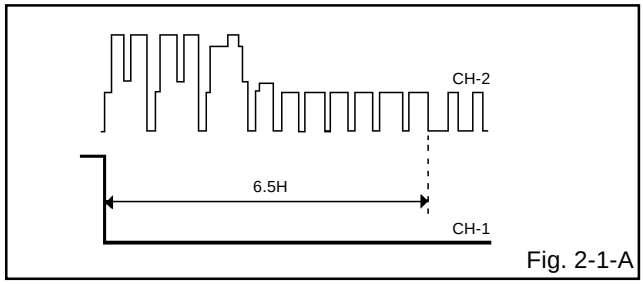


Fig. 2-1-A

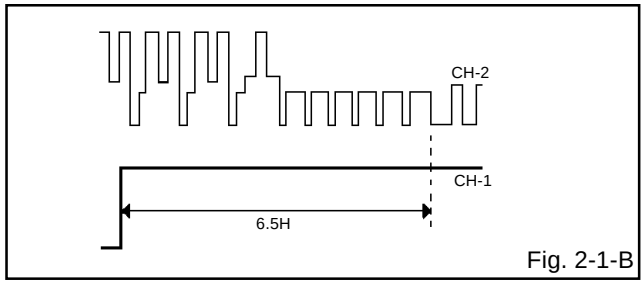


Fig. 2-1-B

ELECTRICAL ADJUSTMENTS

2-2: RF AGC

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the VHF HIGH (63dB).
3. Connect the digital voltmeter between the **pin 5 of CP601** and the **pin 1 (GND) of CP601**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(02)** on the remote control to select "RF.AGC".
5. Press the VOL. UP/DOWN button on the remote control until the digital voltmeter is 2.5 ± 0.05V.

2-3: SEPARATION

Please do the method (1) or method (2) adjustment.

Method (1)

1. Set the multi-sound signal generator for each different L-ch and R-ch frequency (Ex. L-ch=2KHz, R-ch=400Hz) and receive the RF signal.
2. Connect the oscilloscope to the **Audio Out Jack**.
3. Press the AUDIO SELECT button on the remote control to set to the stereo mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(35)** on the remote control to select “FM LVL”.
5. Press the VOL. UP/DOWN button on the remote control to adjust it until the audio output wave becomes a fine sine wave.

Method (2)

1. Set the multi-sound signal generator L-ch=1KHz, R-ch =Non input and receive the RF signal.
2. Connect the oscilloscope to the **Audio Out Jack (R-ch)**.
3. Press the AUDIO SELECT button on the remote control to set to the stereo mode.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(35)** on the remote control to select “FM LVL”.
5. Press the VOL. UP/DOWN button on the remote control to adjust it until the R-ch output becomes minimum.
6. Set the multi-sound signal generator L-ch=Non input, R-ch=1KHz and receive the RF signal.
7. Connect the oscilloscope to the **Audio Out Jack (L-ch)**.
8. Press the AUDIO SELECT button on the remote control to set to the stereo mode.
9. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(35)** on the remote control to select “FM LVL”.
10. Press the VOL. UP/DOWN button on the remote control to adjust it until the L-ch output becomes minimum.

(TV SECTION)

2-4: CONSTANT VOLTAGE

1. Set condition is AV MODE without signal.
2. Using the remote control, set the brightness and contrast to normal position.
3. Connect the digital voltmeter to **TP401**.
4. Adjust the **VR1701** until the digital voltmeter is 117 ± 0.5V.

2-5: CUT OFF

1. Place the set with Aging Test for more than 15 minutes.
2. Set condition is AV MODE without signal.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(01)** on the remote control to select "CUT OFF".
5. Adjust the **Screen Volume** until a dim raster is obtained.

2-6: WHITE BALANCE

NOTE: Adjust after performing CUT OFF adjustment.

1. Place the set with Aging Test for more than 15 minutes.
2. Receive the gray scale pattern from the Pattern Generator.
3. Using the remote control, set the brightness and contrast to normal position.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(13)** on the remote control to select "R.BIAS".
5. Press the CH. UP/DOWN button on the remote control to select the "R.BIAS", "G.BIAS", "B.BIAS", "B.DRV" or "G.DRV".
6. Adjust the VOL. UP/DOWN button on the remote control to whiten the R.BIAS, G.BIAS, B.BIAS, B.DRV, and G.DRV at each step tone sections equally.
7. Perform the above adjustments 5 and 6 until the white color is looked like a white.

2-7: FOCUS

1. Receive the monoscope pattern.
2. Turn the Focus Volume fully counterclockwise once.
3. Adjust the **Focus Volume** until picture is distinct.

2-8: HORIZONTAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(04)** on the remote control to select "H.POSI".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on right and left becomes minimum.

2-9: VERTICAL POSITION

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Adjust the **VR404** until the horizontal line becomes fit to the notch of the shadow mask.

ELECTRICAL ADJUSTMENTS

2-10: VERTICAL SIZE

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(07)** on the remote control to select "V.SIZE".
4. Press the VOL. UP/DOWN button on the remote control until the Up/Down OVER SCAN Quantity becomes equal to the Right/Left OVER SCAN Quantity.

2-11: VERTICAL LINEARITY

NOTE: Adjust after performing adjustments in section 2-10. After the adjustment of Vertical Linearity, reconfirm the Vertical Position and Vertical Size adjustments.

1. Receive the monoscope pattern.
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(09)** on the remote control to select "V.LIN".
4. Press the VOL. UP/DOWN button on the remote control until the SHIFT quantity of the OVER SCAN on upside and downside becomes minimum.

2-12: OSD HORIZONTAL

1. Activate the adjustment mode display of **Fig. 1-1**.
2. Press the VOL. UP/DOWN button on the remote control until the difference of A and B becomes minimum. **(Refer to Fig. 2-2)**

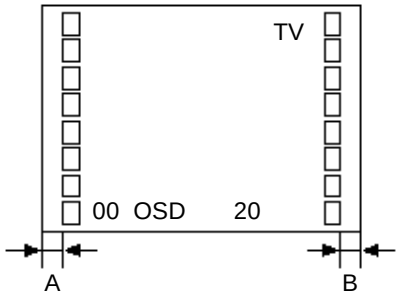


Fig. 2-2

2-13: SUB BRIGHT CENTER

1. Receive the monoscope pattern. (RF Input)
2. Using the remote control, set the brightness and contrast to normal position.
3. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI CENT".
4. Press the VOL. UP/DOWN button on the remote control until the white 10% is starting to be visible
5. Receive the monoscope pattern. (Audio Video Input)
6. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~4.
7. Press the DVD button on the remote control to set to the DVD mode.
8. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(16)** on the remote control to select "BRI CENT".
9. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

2-14: SUB TINT CENTER

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP803**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(26)** on the remote control to select "TNT".
5. Press the VOL. UP/DOWN button on the remote control until the section "A" becomes a straight line **(Refer to Fig. 2-3)**.
6. Receive the color bar pattern. (Audio Video Input)
7. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~5.
8. Press the DVD button on the remote control to set to the DVD mode.
9. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(26)** on the remote control to select "TNT".
10. Press the VOL. UP/DOWN button on the remote control until the tint step No. becomes "48"

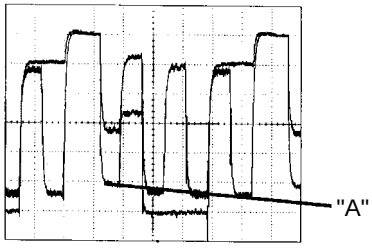


Fig. 2-3

ELECTRICAL ADJUSTMENTS

2-15: SUB COLOR CENTER

1. Receive the color bar pattern. (RF Input)
2. Using the remote control, set the brightness, contrast, color and tint to normal position.
3. Connect the oscilloscope to **TP802**.
4. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(23)** on the remote control to select "COL CENT".
5. Adjust the VOLTS RANGE VARIABLE knob of the oscilloscope until the range between white 100% and 0% is set to 4 scales on the screen of the oscilloscope.
6. Press the VOL. UP/DOWN button on the remote control until the red color level is adjusted to 120 ± 5% of the white level. **(Refer to Fig. 2-4)**
7. Receive the color bar pattern. (Audio Video Input)
8. Press the INPUT SELECT button on the remote control to set to the AV mode. Then perform the above adjustments 2~6.
9. Press the DVD button on the remote control to set to the DVD mode.
10. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(23)** on the remote control to select "COL CENT".
11. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

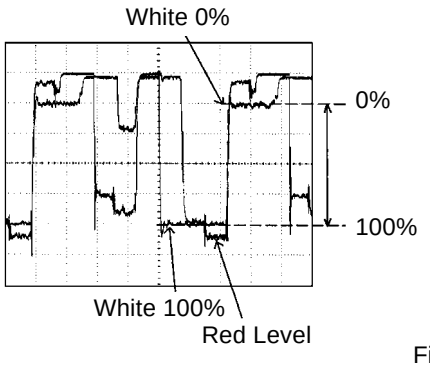


Fig. 2-4

2-16: SUB CONTRAST MAX

1. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(21)** on the remote control to select "UNI COL MAX".
2. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "108".
3. Receive a broadcast and check if the picture is normal.
4. Press the INPUT SELECT button on the remote control to set to the AV mode.
5. Activate the adjustment mode display of **Fig. 1-1** and press the channel button **(21)** on the remote control to select "UNI COL MAX".
6. Press the VOL. UP/DOWN button on the remote control until the contrast step No. becomes "110".
7. Receive a broadcast and check if the picture is normal.
8. Press the DVD button on the remote control to set to the DVD mode.
9. Press the VOL. UP/DOWN button on the remote control to set the same step numbers as the AV mode.

2-17: Confirmation of Fixed Value (step No.)

Please check if the fixed values of the each adjustment items are set correctly referring below.

NO.	FUNCTION	RF	AV	DVD
05	V.POSI	00	00	00
06	H.SIZE	31	31	31
08	V CENT	30	30	30
10	VS CORR	10	10	10
17	BRI.MAX	85	85	85
18	BRI.MIN	20	20	20
19	SUB CONT	07	07	07
20	UNI COL CENT	50	50	50
22	UNI COL MIN	15	15	15
24	COL.MAX	100	100	100
25	COLMIN	00	00	00
27	SHARP	40	30	40
28	RGB CONT	25	25	25
29	PARABOLA	31	31	31
30	TRAPEZIUM	31	31	31
31	COR TOP	15	15	15
32	COR BTM	15	15	15
33	V EHT	02	02	02
34	H EHT	05	05	05

ELECTRICAL ADJUSTMENTS

3. PURITY AND CONVERGENCE ADJUSTMENTS

NOTE

1. Turn the unit on and let it warm up for at least 30 minutes before performing the following adjustments.
2. Place the CRT surface facing east or west to reduce the terrestrial magnetism.
3. Turn ON the unit and demagnetize with a Degauss Coil.

3-1: STATIC CONVERGENCE (ROUGH ADJUSTMENT)

1. Tighten the screw for the magnet. Refer to the adjusted CRT for the position. **(Refer to Fig. 3-1)**
   If the deflection yoke and magnet are in one body, untighten the screw for the body.
2. Receive the green raster pattern from the color bar generator.
3. Slide the deflection yoke until it touches the funnel side of the CRT.
4. Adjust center of screen to green, with red and blue on the sides, using the pair of purity magnets.
5. Switch the color bar generator from the green raster pattern to the crosshatch pattern.
6. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
7. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.
8. Adjust the crosshatch pattern to change to white by repeating steps 6 and 7.

3-2: PURITY

NOTE

Adjust after performing adjustments in section 3-1.

1. Receive the green raster pattern from color bar generator.
2. Adjust the pair of purity magnets to center the color on the screen.
   Adjust the pair of purity magnets so the color at the ends are equally wide.
3. Move the deflection yoke backward (to neck side) slowly, and stop it at the position when the whole screen is green.
4. Confirm red and blue colors.
5. Adjust the slant of the deflection yoke while watching the screen, then tighten the fixing screw.

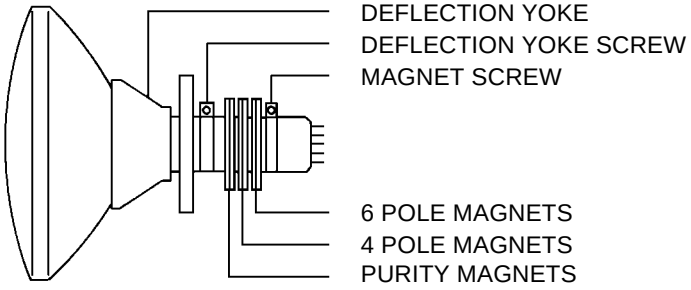


Fig. 3-1

3-3: STATIC CONVERGENCE

NOTE

Adjust after performing adjustments in section 3-2.

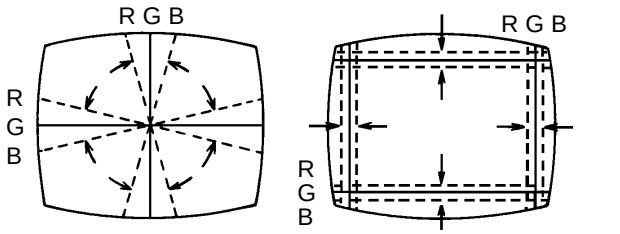
1. Receive the crosshatch pattern from the color bar generator.
2. Combine red and blue of the 3 color crosshatch pattern on the center of the screen by adjusting the pair of 4 pole magnets.
3. Combine red/blue (magenta) and green by adjusting the pair of 6 pole magnets.

3-4: DYNAMIC CONVERGENCE

NOTE

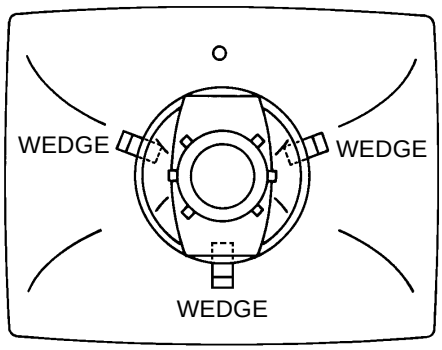
Adjust after performing adjustments in section 3-3.

1. Adjust the differences around the screen by moving the deflection yoke upward/downward and right/left. **(Refer to Fig. 3-2-a)**
2. Insert three wedges between the deflection yoke and CRT funnel to fix the deflection yoke. **(Refer to Fig. 3-2-b)**



UPWARD/DOWNWARD SLANT RIGHT/LEFT SLANT

Fig. 3-2-a

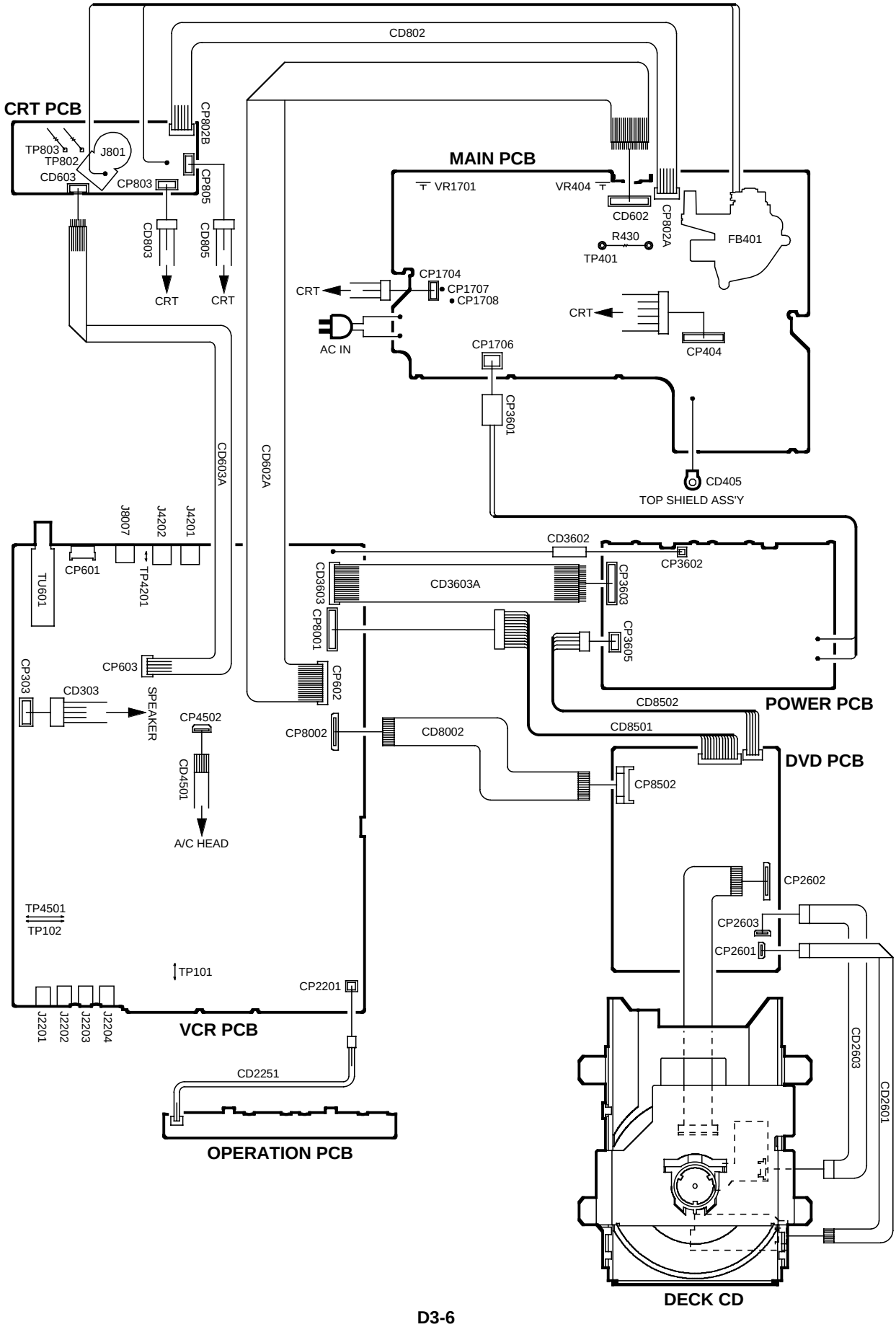


WEDGE POSITION

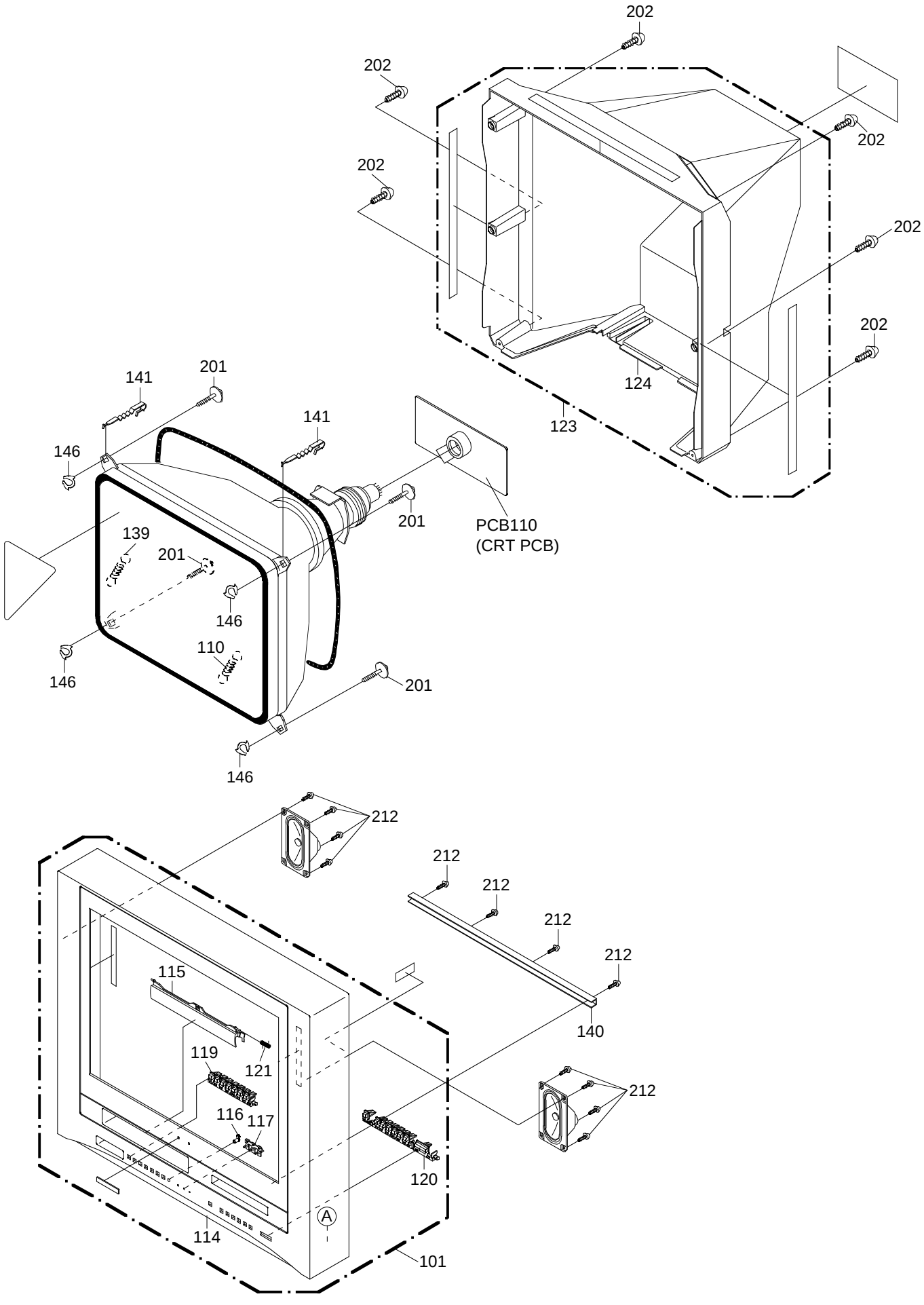
Fig. 3-2-b

ELECTRICAL ADJUSTMENTS

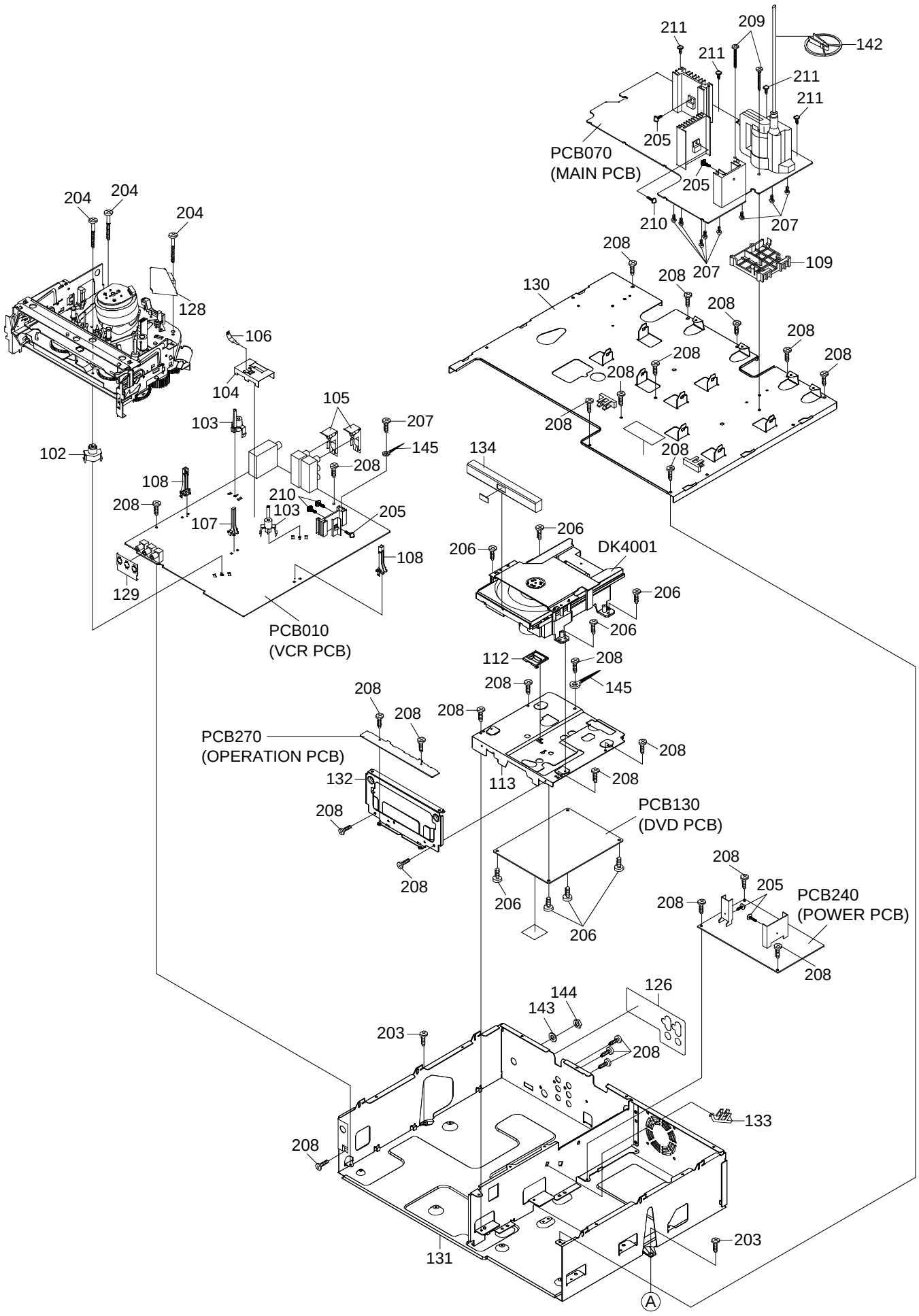
2. ELECTRICAL ADJUSTMENT PARTS LOCATION GUIDE (WIRING CONNECTION)



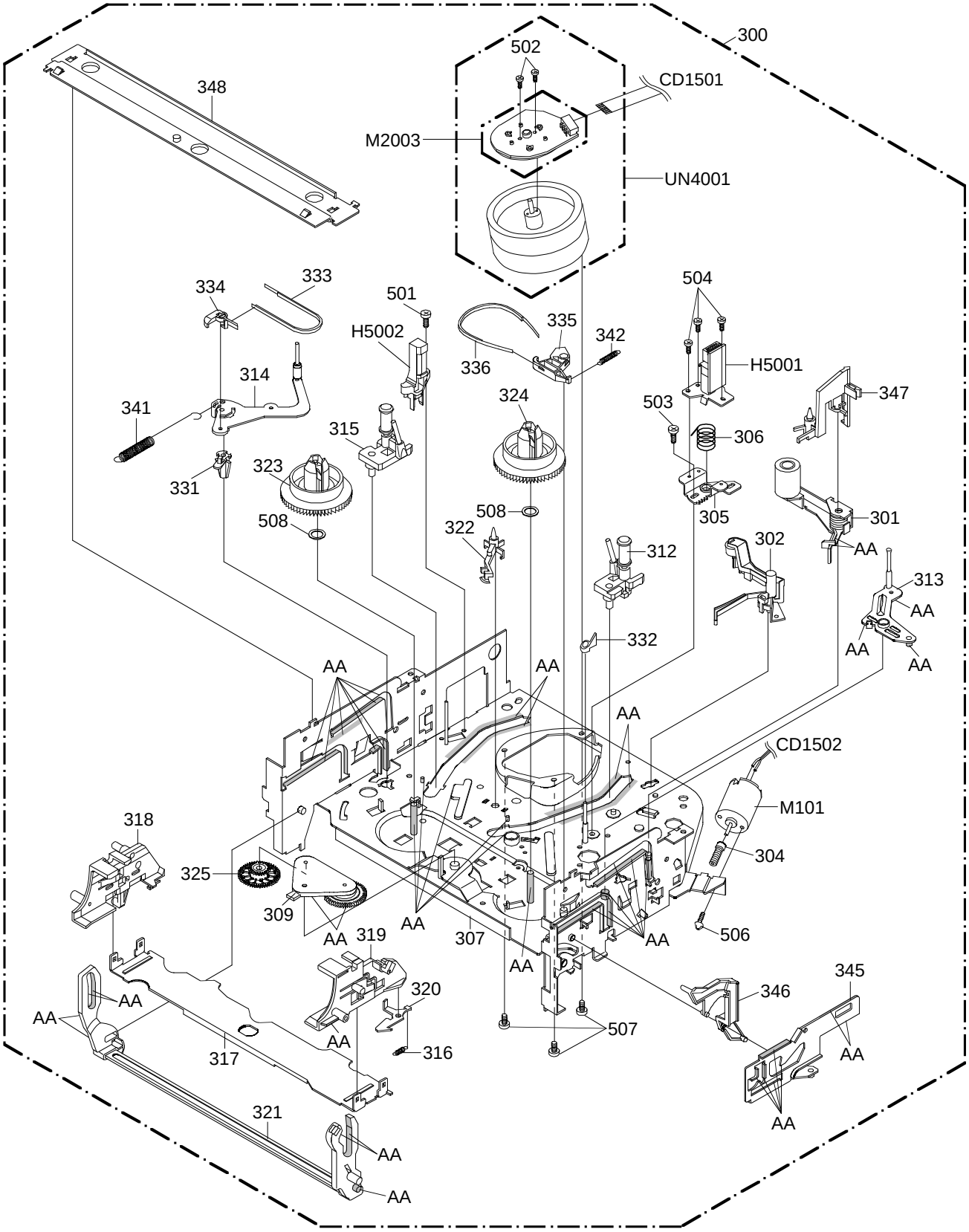
MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW



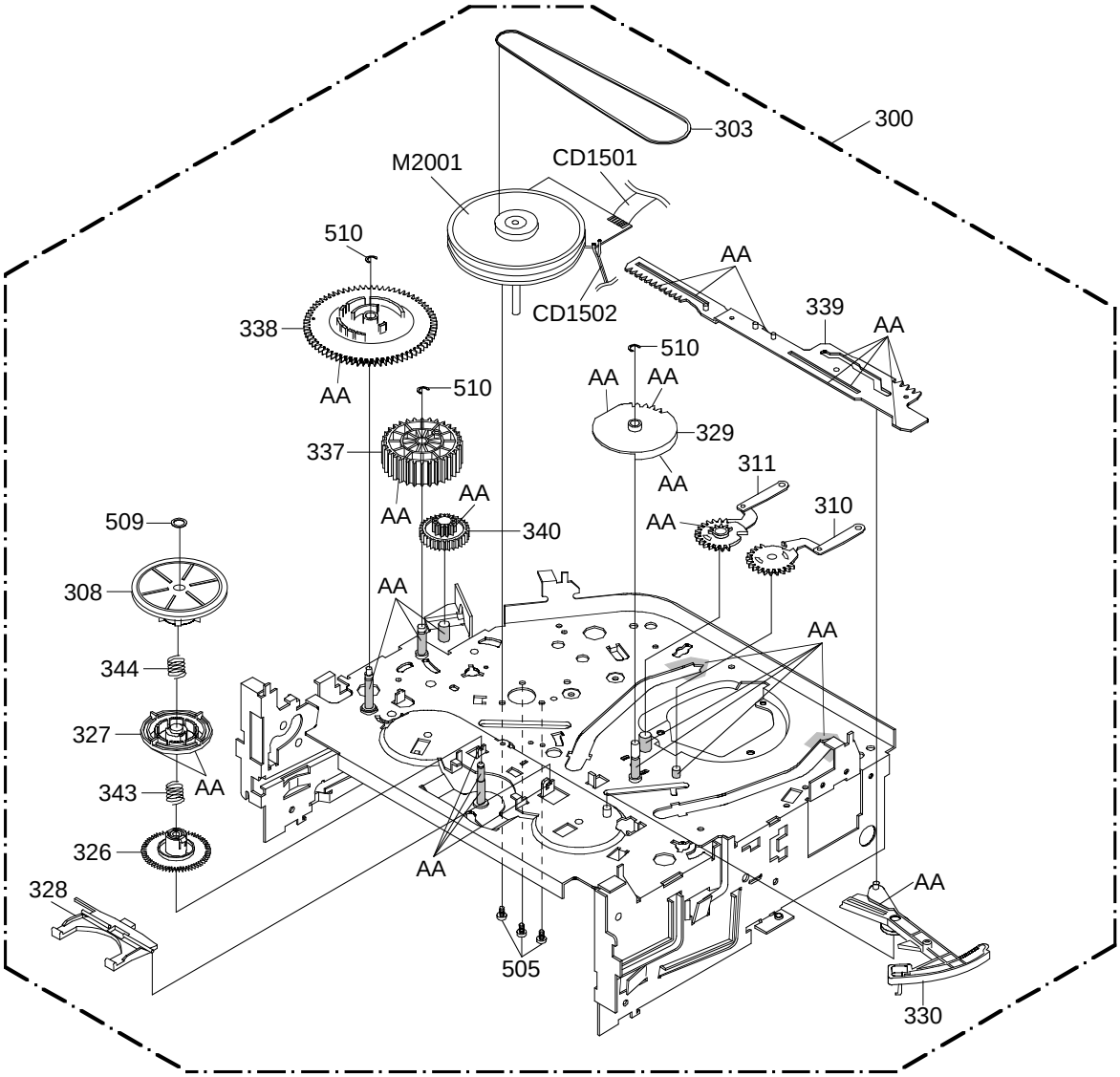
CHASSIS EXPLODED VIEW (TOP VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CLASS	MARK
GREASE	AA

NOTE: Applying positions AA for the grease are displayed for this section.
Check if the correct grease is applied for each position.

MECHANICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
101	BZ310373	A5B6010720	CABINET,FRONT ASSY	
102	BZ710577	701WPA0686	HOLDER,DECK	
103	BZ710658	701WPA0751	HOLDER,DECK	
104	BZ710466	752WSA0230	SHIELD,CASE HEAD AMP	
105	BZ710659	752WSA0290	SHIELD,COMPO	
106	BZ710331	753WUAA006	SPRING,EARTH HEAD AMP	
107	BZ710497	85OP700037	HOLDER,LED	
108	BZ710498	85OP700038	HOLDER,END SENSOR	
109	BZ710459	761WPA0223	HOLDER,FBT	
110	BZ710660	741WUA0021	SPRING,EARTH	
112	BZ710661	761WPA0244	HOLDER,FFC	
113	BZ710662	761WSA0089	ANGLE,DECK	
114	BZ710663	701WPJ1120	CABINET,FRONT	
115	BZ710664	712WPJ0769	FLAP	
116	BZ710665	713WPA0160	GUIDE,REMOCON	
117	BZ710666	713WPA0195	GLASS,LED	
119	BZ710667	735WPB0216	BUTTON,FRAME1	
120	BZ710668	735WPB0217	BUTTON,FRAME2	
121	BZ710010	743WKA0032	SPRING,FLAP	
123	BZ310374	A5B6010740	CABINET,BACK ASSY	
124	BZ710669	702WPA0918	CABINET,BACK	
126	BZ710670	7230007456	SHEET,JACK	
128	BZ710633	752WSA0275	COVER,AC HEAD	
129	BZ710671	752WSA0292	SHIELD,AV JACK	
130	BZ710672	752WSA0295	SHIELD,TOP ASS'Y	
131	BZ710673	752WSA0296	PLATE,BOTTOM ASS'Y	
132	BZ710674	753WSA0149	SHIELD,FRONT	
133	BZ710694	774WPA0002	HOLDER,WIRE	
134	BZ710676	712WPB0109	PLATE,TRAY-FRONT	
139	BZ710258	741WUA0001	SPRING,EARTH	
140	BZ710677	752WSA0287	ANGLE,FRONT	
141	BZ710259	762WPA0011	HOLDER,CRT WIRE	
142	BZ710260	899HV3T000	HOLDER,ANODE WIRE	
143	BZ710037	82A97A4077	WASHER	9.7x14xT0.7
144	BZ710038	8300495207	NUT (VOLUME NUT 3/8 INCH)	
145	BZ710039	8995034000	CORD CLIP UL CO.	
146	BZ710376	769WSA0011	WASHER CRT T=0.5	
201	BZ710275	8121J50B54	SCREW,TAPPING(B0) GW20	5x28
202	BZ710035	8117540A64	SCREW,TAPPING(B0) TRUSS	4x16
203	BZ710320	8117540804	SCREW,TAPPING(B0) TRUSS	4x8
204	BZ710582	8109130B94	SCREW,TAP TITE(B) R PAN	3x29
205	BZ710239	8109I30A04	SCREW,TAP TITE(B) WH7	3x10
206	BZ710562	8109I30804	SCREW,TAP TITE(B) WH7	3x8
207	BZ710019	8109630802	SCREW,TAP TITE(B) BRAZIER	3x8
208	BZ710678	8109230804	SCREW,TAP TITE(B) BIND	3x8
209	BZ710409	8107630B04	SCREW,TAP TITE(S) BRAZIER	3x20
210	BZ710018	8107630804	SCREW,TAP TITE(S) BRAZIER	3x8
211	BZ710337	8107930604	SCREW,CUP(S)	3x6
212	BZ710030	8110630804	SCREW,TAP TITE(P) BRAZIER	3x8
---	BZ710679	792WHA0352	PACKAGE,TOP	
---	BZ710680	792WHA0353	PACKAGE,BOTTOM	
---	BZ710681	793WCD1411	GIFT BOX	
---	BZ614433	J5B60101	INSTRUCTION BOOK	

CHASSIS REPLACEMENT PARTS LIST

	Location No.	TSB P/N	Reference No.	Description	
	300	BZ310375	A5B701Z420A	DECK ASSY	A5B701Z420A
	301	BZ710564	85OA400234	PINCH ROLLER BLOCK	
	302	BZ710682	85OA500026	AHC ASS'Y	
	303	BZ710193	85OP200290	BELT,CAPSTAN (S)	
	304	BZ710515	85OP600581	WORM	
	305	BZ710094	85OP500083	BASE,AC HEAD	
	306	BZ710112	85OP800324	SPRING,AC HEAD	
	307	BZ710516	85OA000459	MAIN CHASSIS ASS'Y	
	308	BZ710517	85OA200089	CLUTCH ASS'Y	
	309	BZ710518	85OA200090	ARM IDLER ASS'Y	
	310	BZ710519	85OA300065	LOADING ARM S UNIT	
	311	BZ710520	85OA300066	LOADING ARM T UNIT	
	312	BZ710521	85OA400223	INCLINED BASE T UINT 3S	
	313	BZ710522	85OA400232	P5 ARM ASS'Y 2	
	314	BZ710650	85OA400235	TENSION ARM ASS'Y 2	
	315	BZ710524	85OA400231	INCLINED BASE S UNIT	
	316	BZ710525	85OP800358	SPRING,LOCKER	
	317	BZ710526	85OP900736	CASS,HOLDER	
	318	BZ710527	85OP900748	CASS,SIDE L	
	319	BZ710528	85OP900749	CASS,SIDE R	
	320	BZ710529	85OP900739	LOCKER,R	
	321	BZ710530	85OA900228	LINK UNIT	
	322	BZ710531	85OP000496	POST,CASS GUIDE	
	323	BZ710532	85OP200316	REEL,S (S)	
	324	BZ710533	85OP200317	REEL,T (S)	
	325	BZ710534	85OP200308	GEAR,IDLER	
	326	BZ710535	85OP200311	GEAR,CLUTCH	
	327	BZ710536	85OP200312	GEAR,COUPLING	
	328	BZ710537	85OP200313	LEVER,CLUTCH	
	329	BZ710538	85OP300194	GEAR,MAIN LOADING	
	330	BZ710092	85OP400490	LEVER,TENSION	
	331	BZ710093	85OP400492	HOLDER,TENSION	
	332	BZ710366	85OP400520	CAP.P4	
	333	BZ710539	85OP400539	BAND,TENSION	
	334	BZ710540	85OP400533	CONNECT,TENSION	
	335	BZ710541	85OP600573	ARM,BRAKE T	
	336	BZ710542	85OP600583	BAND,BRAKE T	
	337	BZ710543	85OP600577	CAM,PINCH ROLLER	
	338	BZ710544	85OP600578	CAM,MAIN	
	339	BZ710545	85OP600579	ROD,MAIN	
	340	BZ710546	85OP600582	GEAR,JOINT	
	341	BZ710110	85OP800322	SPRING,TENSION	
	342	BZ710547	85OP800360	SPRING,BRAKE T	
	343	BZ710548	85OP800355	SPRING,COUPLING	
	344	BZ710549	85OP800356	SPRING,RING	
	345	BZ710565	85OP900750	LEVER,LINK 2	
	346	BZ710551	85OP900744	LEVER,FLAP	
	347	BZ710552	85OP900745	CASS,OPENER	
	348	BZ710514	85OP900746	BRACKET,TOP 3V	
	501	BZ710049	8107226804	SCREW,TAP TITE(S) BIND	2.6x8
	502	BZ710390	8107226504	SCREW,TAP TITE(S) BIND	2.6x5
	503	BZ710371	8107226404	SCREW,TAP TITE(S) BIND	2.6x4
	504	BZ710046	8102120604	SCREW,PAN	M2x6
	505	BZ710050	8109126604	SCREW,TAP TITE(B) PAN	2.6x6
	506	BZ710553	810A130404	SCREW/WASHER(A)	M3x4
	507	BZ710219	810A126504	SCREW/WASHER(A)	M2.6x5
	508	BZ710056	82Q264713N	POLYSLIDER WASHER	2.6x4.7xT0.13
	509	BZ710054	82P184505N	POLYSLIDER WASHER(CUT)	1.8x4.5xT0.5
	510	BZ710058	83ETW30000	E-RING	3.0
	CD1501	BZ614338	122H071603	CORD JUMPER	SMCD-7X151
	CD1502	BZ614339	122Y021902	CORD JUMPER	2Y021902
	H5001	BZ710040	1523D91034	HEAD (AUDIO CONTROL)	HVMXA1072A
	H5002	BZ710041	1543D02013	HEAD (FULL ERASE)	HVFHP0032A
⚠	M101	BZ710566	1596P98001	MOTOR (LOADING)	MXN13FB12K3
⚠	M2001	BZ710555	1510S98036	CAPSTAN DD UNIT	F2QVB08
	M2003	BZ710657	1589S11017	MICRO MOTOR	I2OAL05
⚠	UN4001	BZ610340	A5B401B500	CYLINDER UNIT ASS'Y	A5B401B500

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
		RESISTORS		
⚠R401	BZ210244	R4X5T6562F	R,METAL	5.6K OHM 1/6W
⚠R403	BZ210231	R4X5T6153F	R,METAL	15K OHM 1/6W
⚠R405	BZ210231	R4X5T6153F	R,METAL	15K OHM 1/6W
⚠R406	BZ210245	R3X18A101J	R,METAL OXIDE	100 OHM 2W
⚠R412	BZ210021	R65582680J	R,FUSE	68 OHM 1/2W
⚠R417	BZ210246	R3X18A181J	R,METAL OXIDE	180 OHM 2W
⚠R429	BZ210052	R002T21R8J	RC	1.8 OHM 1/2W
R430	BZ210247	R5Y2CF2R7J	R,CEMENT	2.7 OHM 10W
⚠R434	BZ210130	R002T21R5J	RC	1.5 OHM 1/2W
⚠R445	BZ210042	R6558A5R6J	R,FUSE	5.6 OHM 2W
⚠R454	BZ210003	R3K181102J	R,METAL	1K OHM 1W
⚠R814	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
⚠R815	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
⚠R816	BZ210050	R3X18A123J	R,METAL OXIDE	12K OHM 2W
⚠R1701	BZ210206	R002T2155J	RC	1.5M OHM 1/2W
⚠R1702	BZ210080	R0G3K2275K	RC	2.7M OHM 1/2W
⚠R1714	BZ210248	R3X181R15J	R,METAL OXIDE	0.15 OHM 1W
⚠R1717	BZ210249	R3X28A331J	R,METAL OXIDE	330 OHM 2W
⚠R1718	BZ210250	R5Y2CE1R2J	R,CEMENT	1.2 OHM 7W
⚠R1720	BZ210190	R63581R22J	R,FUSE	0.22 OHM 1W
⚠R1727	BZ210051	R3X18AR47J	R,METAL OXIDE	0.47 OHM 2W
⚠R3601	BZ210190	R63581R22J	R,FUSE	0.22 OHM 1W
⚠R3602	BZ210251	R3X181R47J	R,METAL OXIDE	0.47 OHM 1W
⚠R3604	BZ210252	R3X181561J	R,METAL OXIDE	560 OHM 1W
⚠R3608	BZ210008	R3X181273J	R,METAL OXIDE	27K OHM 1W
⚠R3614	BZ210253	R002T2151J	RC	150 OHM 1/2W
R3616	BZ210182	R002T4103J	RC	10K OHM 1/4W
R4009	BZ210254	R002T43R9J	RC	3.9 OHM 1/4W
		CAPACITORS		
C321	BZ110010	E02L03222M	CE	2200 UF 25V
⚠C408	BZ210157	P4N8FJ562H	CMPP	0.0056UF 1.25KV
⚠C418	BZ210161	P4N8FJ682H	CMPP	0.0068UF 1.25KV
⚠C430	BZ110224	E5EZF3332M	CE	3300 UF 25V
⚠C434	BZ110124	E5EZF4222M	CE	2200 UF 35V
⚠C439	BZ110055	E5EZF4102M	CE	1000 UF 35V
C441	BZ110136	P4J7F3394J	CMPP	0.39 UF 250V PMS
⚠C446	BZ110225	E5EZFD220M	CE	22 UF 250V
C449	BZ110182	C03L0R713K	CC	0.001 UF 2KV R
C820	BZ110182	C03L0R713K	CC	0.001 UF 2KV R
C1548	BZ110242	CQGTF0415Z	CC	0.1 UF 50V F
C1549	BZ110242	CQGTF0415Z	CC	0.1 UF 50V F
⚠C1701	BZ110145	P2472B104M	CMP	0.1 UF 275V PHE840
⚠C1702	BZ110145	P2472B104M	CMP	0.1 UF 275V PHE840
C1707	BZ110181	C03L0R7H3K	CC	0.0022UF 2KV R
⚠C1708	BZ110226	C0JBB07H3K	CC	0.0022UF 2KV B
⚠C1710	BZ110226	C0JBB07H3K	CC	0.0022UF 2KV B
⚠C1711	BZ110227	CD39E0ML3M	CC	0.0033UF 250V
⚠C1714	BZ110012	E51CGC471M	CE	470 UF 200V
⚠C1717	BZ110124	E5EZF4222M	CE	2200 UF 35V
⚠C1718	BZ110032	E5EZF3102M	CE	1000 UF 25V
C1719	BZ110176	C03L0R7Q2K	CC	470 PF 2KV R
⚠C1720	BZ110228	E62NFB221M	CE	220 UF 160V
⚠C3008	BZ110229	E02LU4220M	CE	22 UF 35V
C3601	BZ110172	C03L0R7U2K	CC	680 PF 2KV R
⚠C3602	BZ110145	P2472B104M	CMP	0.1 UF 275V PHE840
⚠C3603	BZ110145	P2472B104M	CMP	0.1 UF 275V PHE840
⚠C3609	BZ110130	E62NFC221M	CE	220 UF 200V
C3614	BZ110038	C0JFE0514M	CC	0.01 UF 500V E
⚠C3617	BZ110222	CD39E0MH3M	CC	0.0022UF 250V
C3623	BZ110243	CQGTB0414K	CC	0.01 UF 50V B
⚠C3624	BZ210176	E02LF3222M	CE	2200 UF 25V
⚠C3627	BZ110205	E02LU5220M	CE	22 UF 50V
⚠C3628	BZ110230	E02LF1332M	CE	3300 UF 10V
⚠C3629	BZ110231	E62F00222M	CE	2200 UF 6.3V
⚠C3633	BZ110232	E02LU5010M	CE	1 UF 50V
⚠C3634	BZ110053	E02LF3102M	CE	1000 UF 25V
⚠C3635	BZ110207	E02LT2102M	CE	1000 UF 16V
C3642	BZ110244	E02LT0222M	CE	2200 UF 6.3V
		DIODES		
D101	BZ410095	0010100320	INFRARED LED	LNA2702L010R
D102	BZ410077	D2WXSB1400	DIODE,SCHOTTKY	SB140-EIC
D103	BZ410077	D2WXSB1400	DIODE,SCHOTTKY	SB140-EIC
D105	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D106	BZ410109	D97U02001B	DIODE,ZENER	MTZJ20B T-77
⚠D402	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
D403	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D404	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
		DIODES		
D407	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
⚠D408	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D409	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D410	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D411	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
⚠D412	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
D413	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
D414	BZ410019	D97U03001B	DIODE,ZENER	MTZJ30B T-77
⚠D415	BZ410063	D2WTAU02A0	DIODE,SILICON	AU02A-EIC
D416	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D417	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D418	BZ410037	D97U03301B	DIODE,ZENER	MTZJ33B T-77
D603	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D604	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D605	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D606	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D607	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D608	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D609	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D610	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D611	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D612	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D801	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D802	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D803	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1702	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1703	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D1704	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D1705	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D1706	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
D1709	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D1710	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
D1711	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
D1715	BZ410100	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D1716	BZ410092	D2WXN49370	DIODE,SILICON	1N4937
D1717	BZ410100	D97U01801B	DIODE,ZENER	MTZJ18B T-77
⚠D1718	BZ410092	D2WXN49370	DIODE,SILICON	1N4937
⚠D1719	BZ410052	D28F21DQN9	DIODE,SCHOTTKY	21DQ09N-FC4
D1721	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
⚠D1722	BZ410076	D2WXB290S0	DIODE,SILICON	SB290S
⚠D1723	BZ410111	D28F30DF60	DIODE,RECTIFIER	30DF6-FC
D1724	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D1726	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D2201	BZ410022	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D2205	BZ410087	0021E2Q140	LED	LTL-1CHEE-002A
D2206	BZ410087	0021E2Q140	LED	LTL-1CHEE-002A
D2207	BZ410087	0021E2Q140	LED	LTL-1CHEE-002A
D2601	BZ410112	DD5R003680	DIODE,SILICON	1SS368(TPH3)
D2602	BZ410112	DD5R003680	DIODE,SILICON	1SS368(TPH3)
D3003	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D3005	BZ410034	D97U01301B	DIODE,ZENER	MTZJ13B T-77
D3007	BZ410061	D97U01001B	DIODE,ZENER	MTZJ10B T-77
D3009	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
D3011	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D3012	BZ410043	D2WT011E10	DIODE,SILICON	11E1-EIC
⚠D3602	BZ410113	D97U02201B	DIODE,ZENER	MTZJ22B T-77
⚠D3604	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D3605	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D3606	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
⚠D3607	BZ410062	D2WTRM11C0	DIODE,SILICON	RM11C-EIC
D3608	BZ410100	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D3609	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D3610	BZ410114	D2WXGP10K0	DIODE,RECTIFIER	RGP10K-EIC
D3612	BZ410092	D2WXN49370	DIODE,SILICON	1N4937
⚠D3613	BZ410092	D2WXN49370	DIODE,SILICON	1N4937
⚠D3614	BZ410037	D97U03301B	DIODE,ZENER	MTZJ33B T-77
⚠D3616	BZ410115	D2LKB340L0	DIODE,SCHOTTKY	SB340L-6737
⚠D3617	BZ410007	D23TGP15J0	DIODE,SILICON	RGP15J-G23
⚠D3619	BZ410007	D23TGP15J0	DIODE,SILICON	RGP15J-G23
⚠D3620	BZ410115	D2LKB340L0	DIODE,SCHOTTKY	SB340L-6737
⚠D3621	BZ410007	D23TGP15J0	DIODE,SILICON	RGP15J-G23
D3623	BZ410085	D2WXN40050	DIODE,SILICON	1N4005-EIC
⚠D3625	BZ410092	D2WXN49370	DIODE,SILICON	1N4937
D4001	BZ410085	D2WXN40050	DIODE,SILICON	1N4005-EIC
D4201	BZ410021	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D4204	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D4205	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description
		DIODES		
D4207	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D5501	BZ410012	D28TQS04N0	DIODE,SCHOTTKY	11EQS04N-TA1B2
D5502	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D8003	BZ410006	D1VT001330	DIODE,SILICON	1SS133T-77
D8501	BZ410116	DD5R002260	DIODE,SILICON	1SS226(TE85L)
D8502	BZ410116	DD5R002260	DIODE,SILICON	1SS226(TE85L)
D8503	BZ410116	DD5R002260	DIODE,SILICON	1SS226(TE85L)
D8504	BZ410116	DD5R002260	DIODE,SILICON	1SS226(TE85L)
D8505	BZ410116	DD5R002260	DIODE,SILICON	1SS226(TE85L)
		ICS		
IC101	BZ611098	I51F58073A	IC	OEC8073A
IC103	BZ611057	IC7J0311A0	IC	R3111N311A/C-TR
IC199	BZ310366	A5B6010015	IC	S-24C04BDP-LA
IC301	BZ611063	I06F062420	IC	M62420FP
IC352	BZ611035	I0FSP75220	IC	AN7522
⚠IC401	BZ611025	I03TD80400	IC	LA78040
IC402	BZ611099	I1K998L050	IC	KIA78L05BP-AT
IC601	BZ611064	I05DC12530	IC	TB1253N
IC1001	BZ611100	I55K0251AF	IC	OEC6069A
IC1002	BZ611101	I5HJ001BF0	IC	S-24C01BFJ-TB
IC1005	BZ611102	I55F07S08F	IC	TC7S08F-TE85L
IC1006	BZ611103	I55F0W2410	IC	TC7W241FU-TE12L
IC1501	BZ611079	I05FE90A45	IC	TC90A45F
IC1502	BZ611104	I0QF02533V	IC	NJM2533V(TE2)
IC1503	BZ611104	I0QF02533V	IC	NJM2533V(TE2)
IC1504	BZ611104	I0QF02533V	IC	NJM2533V(TE2)
IC1505	BZ611104	I0QF02533V	IC	NJM2533V(TE2)
⚠IC1701	BZ410088	0002E00610	PHOTO COUPLER	LTV-817M-VB
IC2001	BZ611105	I05F094A03	IC	OEC6068A
IC2002	BZ611106	I59J0258B3	IC	MSM5416258B-30
IC2601	BZ611107	I55F07S04F	IC	TC7S04F(TE85L)
IC2602	BZ611108	I07FV58130	IC	BA5813FM
IC2603	BZ611109	I05FR1323F	IC	OEC6067A
⚠IC3001	BZ611015	I1KA97805A	IC	KIA7805API
IC3002	BZ611089	I1KA98R09A	IC	KIA78R09API
⚠IC3601	BZ611019	I1KJ9A4310	IC	KIA431
⚠IC3602	BZ611033	I1KA97809A	IC	KIA7809API
⚠IC3603	BZ410088	0002E00610	PHOTO COUPLER	LTV-817M-VB
IC4001	BZ611110	ICQF067320	IC	ZR36732
IC4002	BZ611111	I5HF96A250	IC	S-816A25AMC-BAA-T2
IC4003	BZ611112	I59J0160FB	IC	MSM56V16160F-8
IC4004	BZ611112	I59J0160FB	IC	MSM56V16160F-8
IC4005	BZ611106	I59J0258B3	IC	MSM5416258B-30
IC4006	BZ611113	I5QJ0F8415	IC	MBM29F800BA-55PFTN-SFK-41
IC4501	BZ611095	I03F3205M0	IC	LA71205M-MPB
IC5501	BZ611114	I01F63FBP0	IC	AN3663FBP
IC8001	BZ611104	I0QF02533V	IC	NJM2533V(TE2)
IC8002	BZ611104	I0QF02533V	IC	NJM2533V(TE2)
IC8004	BZ611074	I0QF045800	IC	NJM4580M
IC8501	BZ611115	I55F0H08F0	IC	TC7SH08FU(TE85L)
IC8503	BZ611116	I1BF019590	IC	AD1959YRSRL
IC8504	BZ611117	I0UFG540A0	IC	MM1540AFBE
		TRANSISTORS		
Q101	BZ410097	0000M00390	PHOTO TRANSISTOR	ST-304L
Q102	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q103	BZ410097	0000M00390	PHOTO TRANSISTOR	ST-304L
Q104	BZ410106	0002700680	PHOTO COUPLER	RPI-352C40N
Q105	BZ410106	0002700680	PHOTO COUPLER	RPI-352C40N
Q106	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q107	BZ410107	0002700690	PHOTO COUPLER	RPI-303
Q108	BZ410107	0002700690	PHOTO COUPLER	RPI-303
Q110	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q114	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q115	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q116	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q117	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q350	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
⚠Q401	BZ510097	TCAT03227Y	TRANSISTOR,SILICON	KTC3227_Y-AT
⚠Q403	BZ510040	TDUU024990	TRANSISTOR,SILICON	2SD2499(LB0EC1)
Q601	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q603	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q604	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q605	BZ510061	T83A028140	TRANSISTOR,SILICON	2SC2814(F3,F4)-T
Q606	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q607	BZ510090	TPAAB05001	COMPOUND TRANSISTOR	KRA102SRTK
Q608	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
⚠Q802	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		TRANSISTORS		
⚠Q803	BZ510100	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
⚠Q804	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠Q805	BZ510100	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
⚠Q806	BZ510091	TCA0042170	TRANSISTOR,SILICON	KTC4217(O,Y)
⚠Q807	BZ510100	TCATC3199Y	TRANSISTOR,SILICON	KTC3199_Y-AT
Q1003	BZ510025	TPYJB05001	COMPOUND TRANSISTOR	DTA114EKAT146
Q1004	BZ510025	TPYJB05001	COMPOUND TRANSISTOR	DTA114EKAT146
Q1501	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q1502	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q1503	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q1504	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q1701	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q1702	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
⚠Q1703	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
⚠Q1705	BZ510098	T220033260	FET	2SK3326(2)
⚠Q1706	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
⚠Q1707	BZ510004	TA3T016240	TRANSISTOR,SILICON	2SA1624-AA
Q2001	BZ510101	T85A03326B	TRANSISTOR,SILICON	2SC3326_B(TE85L)
Q2201	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q2202	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q2203	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q2601	BZ510071	TNAAB05003	COMPOUND TRANSISTOR	KRC102SRTK
Q2602	BZ510102	TS5M000037	COMPOUND TRANSISTOR	HN1C03F_B(TE85L)
Q2603	BZ510103	TS5M000036	COMPOUND TRANSISTOR	HN1B01F_Y(TE85L)
Q2604	BZ510103	TS5M000036	COMPOUND TRANSISTOR	HN1B01F_Y(TE85L)
Q2605	BZ510104	T65A01213Y	TRANSISTOR,SILICON	2SA1213_Y(TE12L,C)
Q3001	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
⚠Q3002	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q3004	BZ510072	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK
Q3005	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
⚠Q3006	BZ510106	TAAT01241Y	TRANSISTOR,SILICON	KTA1241_Y-AT
Q3007	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q3008	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q3009	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q3011	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q3015	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
⚠Q3601	BZ510093	TJXG5NC500	FET	STP5NC50FP
⚠Q3602	BZ510044	TC5T021204	TRANSISTOR,SILICON	2SC2120Y(TPE2)
Q3605	BZ611095	TNATA03002	COMPOUND TRANSISTOR	KRC101MAT
⚠Q3606	BZ510106	TAAT01241Y	TRANSISTOR,SILICON	KTA1241_Y-AT
⚠Q3607	BZ510105	TCAT03209Y	TRANSISTOR,SILICON	KTC3209_Y-AT
Q4001	BZ510104	T65A01213Y	TRANSISTOR,SILICON	2SA1213_Y(TE12L,C)
Q4201	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4202	BZ510072	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK
Q4203	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4204	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q4207	BZ510107	TPAAA05001	COMPOUND TRANSISTOR	KRA101SRTK
Q4210	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q4211	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4212	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q4501	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q4502	BZ510069	TCATC31980	TRANSISTOR,SILICON	KTC3198-AT(Y,GR)
Q4503	BZ510072	TPAAC05002	COMPOUND TRANSISTOR	KRA103SRTK
Q4504	BZ510070	TCAT032034	TRANSISTOR,SILICON	KTC3203_Y-AT
Q4505	BZ510073	TAATA12660	TRANSISTOR,SILICON	KTA1266-AT(Y,GR)
Q4506	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4507	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q4509	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q4511	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q8001	BZ510001	T6YJ1037K0	TRANSISTOR,SILICON	2SA1037AKT146R,S
Q8002	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q8006	BZ510002	T8YJ2412K0	TRANSISTOR,SILICON	2SC2412KT146 R,S
Q8007	BZ510067	TNAAC05002	COMPOUND TRANSISTOR	KRC103SRTK
Q8501	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q8502	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q8503	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q8505	BZ510108	TAAA1504SY	TRANSISTOR,SILICON	KTA1504S_Y_RTK
Q8508	BZ510102	TS5M000037	COMPOUND TRANSISTOR	HN1C03F_B(TE85L)
Q8509	BZ510109	TCAA3875SY	TRANSISTOR,SILICON	KTC3875S_Y_RTK
Q8510	BZ510090	TPAAB05001	COMPOUND TRANSISTOR	KRA102SRTK
Q8511	BZ510090	TPAAB05001	COMPOUND TRANSISTOR	KRA102SRTK
Q8512	BZ510101	T85A03326B	TRANSISTOR,SILICON	2SC3326_B(TE85L)
Q8513	BZ510101	T85A03326B	TRANSISTOR,SILICON	2SC3326_B(TE85L)
		COILS &TRANSFORMERS		
L101	BZ310009	021LA62R2K	COIL	2.2 UH
L301	BZ310005	02167D101K	COIL	100 UH
L302	BZ310005	02167D101K	COIL	100 UH

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description		
		COILS &TRANSFORMERS			
L402	BZ310063	022100027A	COIL,LINEARITY	ELH5L4113	
L403	BZ310004	021679472K	COIL	4.7 MH	
L601	BZ310005	02167D101K	COIL	100 UH	
L602	BZ310043	021LA6150K	COIL	15 UH	
L603	BZ310041	02167F101J	COIL	100 UH	
L604	BZ310041	02167F101J	COIL	100 UH	
L606	BZ310049	021LA6R22M	COIL	0.22 UH	
L607	BZ310030	021LA6560K	COIL	56 UH	
L608	BZ310005	02167D101K	COIL	100 UH	
L609	BZ310136	021LA63R3K	COIL	3.3 UH	
L612	BZ310041	02167F101J	COIL	100 UH	
L613	BZ310041	02167F101J	COIL	100 UH	
L614	BZ310041	02167F101J	COIL	100 UH	
L801	BZ310179	02167D560K	COIL	56 UH	
L802	BZ310179	02167D560K	COIL	56 UH	
L803	BZ310179	02167D560K	COIL	56 UH	
L804	BZ310069	02167D151K	COIL	150 UH	
L1501	BZ310141	02167F100J	COIL	10 UH	
L1503	BZ310138	021673821K	COIL	820 UH	
L1504	BZ310139	02167F151J	COIL	150 UH	
L1505	BZ310042	021LA6101K	COIL	100 UH	
L1506	BZ310042	021LA6101K	COIL	100 UH	
L1507	BZ613032	10380R1501	DELAY EQ	380R1501	
L1508	BZ310042	021LA6101K	COIL	100 UH	
⚠L1701	BZ310180	029T000105	COIL,LINE FILTER	2R2A752F28	
⚠L1703	BZ310066	028R200024	COIL,DEGAUSS	8R200024	
L1704	BZ310181	02A6B2E0A1	CORE,FERRITE	HF70T22*10*14	
⚠L3601	BZ310154	029T0000A1	COIL,LINE FILTER	0R7A223F24	
L3602	BZ310150	02167E220K	COIL	22 UH	
L3603	BZ310150	02167E220K	COIL	22 UH	
L3604	BZ310150	02167E220K	COIL	22 UH	
L3605	BZ310150	02167E220K	COIL	22 UH	
L4001	BZ310182	0216S3150K	COIL	15 UH	
L4205	BZ310041	02167F101J	COIL	100 UH	
L4501	BZ310039	02167F220J	COIL	22 UH	
L4502	BZ310114	031626009R	COIL,BIAS OSC	1626009	
L4503	BZ310005	02167D101K	COIL	100 UH	
L4504	BZ310041	02167F101J	COIL	100 UH	
L4505	BZ310040	02167F470J	COIL	47 UH	
L4506	BZ310040	02167F470J	COIL	47 UH	
L4508	BZ310024	0326230038	COIL,TRAP	2623003	
L4509	BZ310005	02167D101K	COIL	100 UH	
L4510	BZ310183	021LA6220J	COIL	22 UH	
L4511	BZ310041	02167F101J	COIL	100 UH	
L5501	BZ310042	021LA6101K	COIL	100 UH	
L5502	BZ310039	02167F220J	COIL	22 UH	
L5503	BZ310039	02167F220J	COIL	22 UH	
L5504	BZ310039	02167F220J	COIL	22 UH	
L8001	BZ310041	02167F101J	COIL	100 UH	
L8002	BZ310042	021LA6101K	COIL	100 UH	
L8003	BZ310041	02167F101J	COIL	100 UH	
L8501	BZ310182	0216S3150K	COIL	15 UH	
L8507	BZ310118	02AHB9A972	CORE,FERRITE	W5T29X7.5X19	
T401	BZ310172	045013003J	TRANS,HORIZONTAL DRIVE	ETH14Y47AY	
⚠T1701	BZ310184	0481390264	TRANSFORMER,SWITCHING	81390264	
⚠T3601	BZ310185	0481290954	TRANSFORMER,SWITCHING	81290954	
		JACKS			
⚠J801	BZ614115	066C130017	SOCKET,CATHODE RAY TUBE	CVT3275-5101	
⚠J2201	BZ614361	060J131015	HEADPHONE JACK	MSJ-2000	
J2202	BZ614322	060Q401077	RCA JACK	AV1-09D-3	
J2203	BZ614321	060Q401076	RCA JACK	AV1-09D-4	
J2204	BZ614397	060Q421026	RCA JACK	AV1-09DS-2	
J4201	BZ614398	060J431019	RCA JACK	MSP-213V2-432 PBSN	
J4202	BZ614399	060J411018	RCA JACK	MSP-213V1-432 PBSN	
J8007	BZ614400	060J401082	RCA JACK	MSP-251V-05PBSN	
		SWITCHES			
SW101	BZ612014	0508A11002	SWITCH(LEAF)	MXS01380MPP0	
SW2201	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW2202	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW2203	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW2204	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW2205	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.		Description	
		SWITCHES			
SW2206	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW2207	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	or
	BZ612001	0504201T31	SWITCH,TACT	SKHVBED010	
SW2251	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	
SW2252	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	
SW2253	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	
SW2254	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	
SW2255	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	
SW2256	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	
SW2257	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	
SW2258	BZ612010	0504101T34	SWITCH,TACT	EVQ21505R	
		VARIABLE RESISTORS			
VR404	BZ210255	V1K62H3BT8	VOLUME,SEMI FIXED	NVG6THTB222	
⚠VR1701	BZ210256	V1K6214BT8	VOLUME,SEMI FIXED	NVG6THTB103	
		P.C.BOARD ASSEMBLIES			
PCB010	BZ310367	A5B6010010	PCB ASS'Y	VMB250A	
PCB070	BZ310368	A5B6010070	PCB ASS'Y	TMB533A	
PCB110	BZ310369	A5B6010110	PCB ASS'Y	TCB392A	
PCB130	BZ310370	A5B6010130	PCB ASS'Y	VMA249B	
PCB240	BZ310371	A5B6010240	PCB ASS'Y	VPB155A	
PCB270	BZ310372	A5B6010270	PCB ASS'Y	VEB980A	
		MISCELLANEOUS			
B403	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0	
B1501	BZ310130	024HT03564	CORE,BEADS	W4BRH3.5X6X1	
B1701	BZ310122	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2	
B2201	BZ310130	024HT03564	CORE,BEADS	W4BRH3.5X6X1	
B3601	BZ310122	024HT03563	CORE,BEADS	W4BRH3.5X6X1.0X2	
B8001	BZ310121	024HT03553	CORE,BEADS	W5RH3.5X5X1.0	
B8002	BZ310062	024AC3601C	CORE,BEADS	BLM21A601SPT	
B8006	BZ310130	024HT03564	CORE,BEADS	W4BRH3.5X6X1	
B8501	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04	
B8502	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04	
B8503	BZ310186	024HC31022	CORE,BEADS	FCM2012H-102T04	
BL001	BZ310014	023C00022A	COIL,BALUN	HPN-01	
CD303	BZ614401	06CU147401	CORD,CONNECTOR	CU147401	
CD405	BZ614100	06CH01408A	CORD,EIS CONNECTOR	CH01408A	
CD602	BZ614402	069R2E0589	CONNECTOR PCB SIDE	52147-1410	
CD602A	BZ614431	WML6030038	FLAT CABLE AWM2468 A	WG26 14C BLACK 300MM	
CD603	BZ614212	069R250589	CONNECTOR PCB SIDE	52147-0510	
CD603A	BZ614403	WCL6842038	FLAT CABLE AWM2468 A	WG26 5C GRAY 420MM	
CD802	BZ614404	WDL6032038	FLAT CABLE AWM2468 A	WG26 6C BLACK 320MM	
CD803	BZ614378	06CU823001	CORD,CONNECTOR	CU823001	
CD805	BZ614378	06CU823001	CORD,CONNECTOR	CU823001	
CF601	BZ613016	1011T4R517	FILTER,CERAMIC	EFCT4R5MW5	
CF602	BZ613015	1011T4R504	FILTER,CERAMIC	EFCT4R5YS5A	
CF603	BZ613031	1029045R7G	FILTER,SAW	TSF5229P3	
CF605	BZ613018	1012T04702	FILTER,CERAMIC TRAP	MKT47.3MC110P-TF	
CP101	BZ614289	06972C0010	CONNECTOR PCB SIDE	TMC-J12P-B2	
CP303	BZ614405	069S140439	CONNECTOR PCB SIDE	A2502WR2-4P	
⚠CP404	BZ614303	069S450089	CONNECTOR PCB SIDE	A1561WV2-A5P	
CP601	BZ614330	069X160379	CONNECTOR PCB SIDE	06JQ-ST	
CP602	BZ614406	067U014019	WIRE HOLDER	B2013H02-14P	
CP603	BZ614276	067U005049	WIRE HOLDER	B2013H02-5P	
CP803	BZ614269	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P	
CP805	BZ614269	069S320010	CONNECTOR PCB SIDE	A2361WV2-2P	
⚠CD1702	BZ614407	120R415906	CORD,AC BUSH	0R415906	
CD2251	BZ614408	06CU220701	CORD,CONNECTOR	CU220701	
CD2601	BZ614409	122H081006	CORD,JUMPER	2H081006	
CD2603	BZ614410	122H060806	CORD,JUMPER	2H060806	
CD3602	BZ614411	06CU011902	CORD,CONNECTOR	CU011902	
CD3603A	BZ614412	WLL6818038	FLAT CABLE AWM2468 A	WG26 13C GRAY 180MM	
CD3603	BZ614304	067U013029	WIRE HOLDER	B2013H02-13P	
CD4501	BZ614373	122F061502	CORD,JUMPER	2F061502	
CD8002	BZ614413	122H0I2302	CORD,JUMPER	2H0I2302	
CD8501	BZ614414	06CU2D3001	CORD,CONNECTOR	CU2D3001	
CD8502	BZ614415	06CU262501	CORD,CONNECTOR	CU262501	
⚠CP1704	BZ614283	069S420110	CONNECTOR PCB SIDE	A1561WV2-2P	or
	BZ614018	069W420029	CONNECTOR PCB SIDE	TV-50P-02-A1	
CP1706	BZ614176	069S320419	CONNECTOR PCB SIDE	A3963WV2-3PD	
CP1707	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100	
CP1708	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100	
CP2201	BZ614416	069S220629	CONNECTOR PCB SIDE	A2001WV2-2P	
CP2601	BZ614417	069EV8T020	CONNECTOR PCB SIDE	04_6232_108_015	
CP2602	BZ614418	069EVNT020	CONNECTOR PCB SIDE	04_6232_123_015	
CP2603	BZ614050	069J760029	CONNECTOR PCB SIDE	IMSA-9604S-06Z14	
CP3601	BZ614419	06CUU24901	CORD,CONNECTOR	CUU24901	

ELECTRICAL REPLACEMENT PARTS LIST

Location No.	TSB P/N	Reference No.	Description	
		MISCELLANEOUS		
CP3602	BZ614016	069W01001A	CONNECTOR PCB SIDE	003P-2100
CP3603	BZ614218	069R2D0589	CONNECTOR PCB SIDE	52147-1310
CP3605	BZ614242	069S260629	CONNECTOR PCB SIDE	A2001WV2-6P
CP4501	BZ614011	0697290620	CONNECTOR PCB SIDE	TOC-C09X-A1
CP4502	BZ614050	069J760029	CONNECTOR PCB SIDE	IMSA-9604S-06Z14
CP4503	BZ614009	0697120320	CONNECTOR PCB SIDE	TMC-T02X-E1
CP8001	BZ614420	069S2D0629	CONNECTOR PCB SIDE	A2001WV2-13P
CP8002	BZ614247	069J7I0029	CONNECTOR PCB SIDE	IMSA-9604S-18Z14
CP802A	BZ614333	067U006049	WIRE HOLDER	B2013H02-6P
CP802B	BZ614333	067U006049	WIRE HOLDER	B2013H02-6P
CP8502	BZ614421	069J7I0019	CONNECTOR PCB SIDE	IMSA-9604S-18Z13
CUS011	BZ710148	800WFAA007	CUSHION B	
CUS012	BZ710149	800WFAA008	CUSHION C	
CUS013	BZ710279	800WFAA006	CUSHION A	
CUS131	BZ710279	800WFAA006	CUSHION A	
⚠DK4001	BZ310376	169J00010A	DECK CD	TU2020R
EL001	BZ614043	124116281A	EYE LET	XRY16X28BD
EL002	BZ614044	124120301A	EYE LET	XRY20X30BD
EL003	BZ614043	124116281A	EYE LET	XRY16X28BD
⚠F1701	BZ614422	081PC6R305	FUSE	51MS063L
⚠FB401	BZ310175	043220054R	TRANSFORMER,FLYBACK	3220054R
FH1701	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
FH1702	BZ614005	06710T0006	HOLDER,FUSE	EYF-52BC
NR1001	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
NR1002	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
NR1003	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
NR1004	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
NR1005	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
NR1006	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
NR1007	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
NR1008	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
NR1009	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
NR1010	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
NR1011	BZ210257	110N4101M3	R,NETWORK	CAY16-101-J-4R
OS2201	BZ614199	077Q004017	REMOTE RECEIVER	PIC-37243SR
⚠RY1701	BZ612009	0560V20115	RELAY	ALKS321
⚠RY1702	BZ612009	0560V20115	RELAY	ALKS321
⚠SP351	BZ614381	070C546004	SPEAKER	SG04H02BRA
⚠SP352	BZ614381	070C546004	SPEAKER	SG04H02BRA
TM101	BZ614423	076D0FG010	TRANSMITTER	T0T201N36010
⚠TU601	BZ310341	0145K00056	TUNER,VHF-UHF	TECC1040PG32E
⚠TH1701	BZ410079	DF5EL3R0A0	DEGAUSS ELEMENT	ZPB45BL3R0A
⚠V801	BZ614382	098W210438	CRT W/DY	A51LVV896X01(O)
X101	BZ613006	100DA32R01	CRYSTAL	DT-26
X102	BZ613033	100CT01403	CRYSTAL	HC-49/U-S
X603	BZ613004	100CT3R505	CRYSTAL	HC-49/C
X1001	BZ613034	1002T00901	CERAMIC OSCILLATOR	CSTCC9M00G53-R0
X4501	BZ613017	100CT3R502	CRYSTAL	HC-49/U
X8501	BZ613035	100WT02706	CRYSTAL	HC-49/U-S

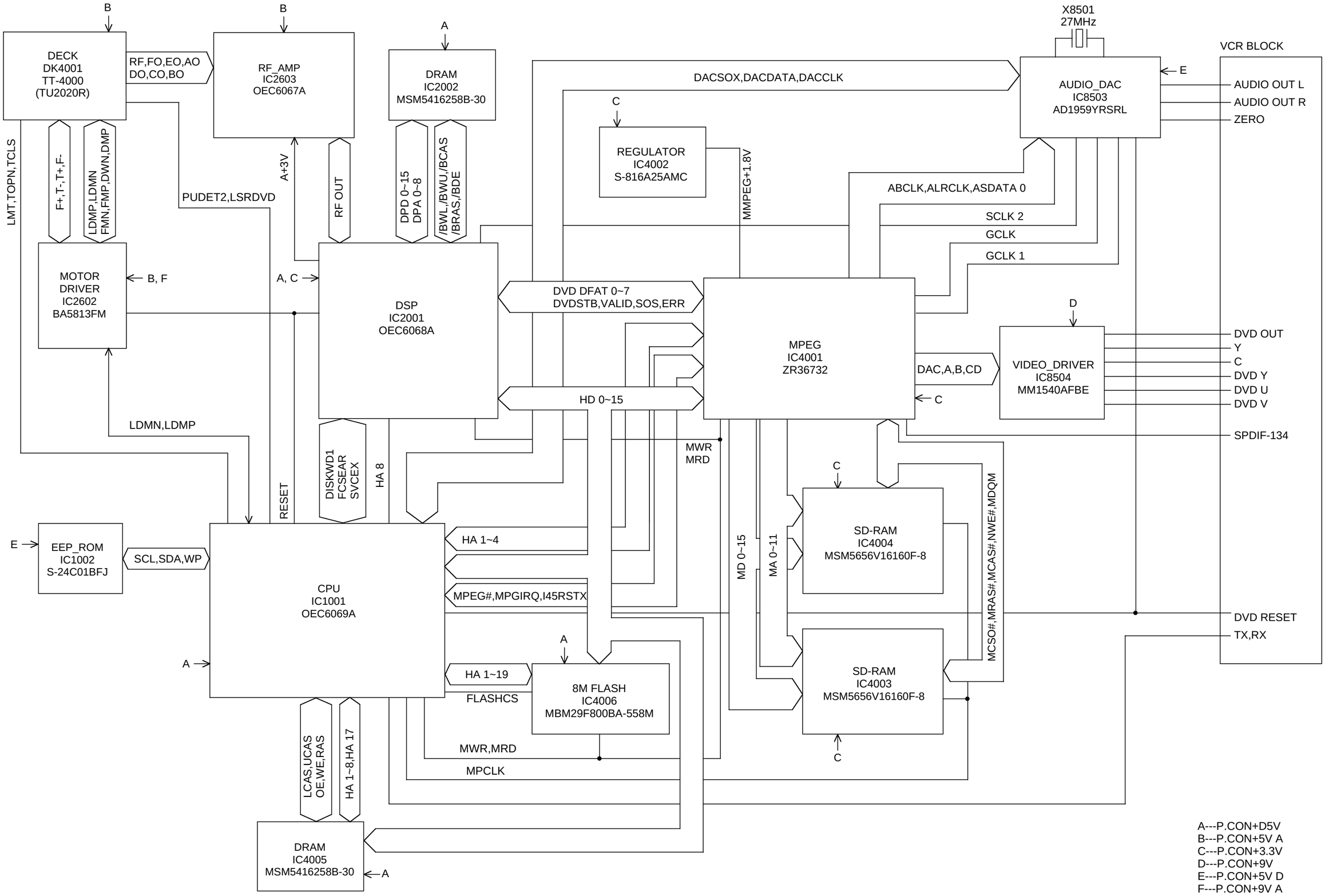
RESISTOR

RC..... CARBON RESISTOR

CAPACITORS

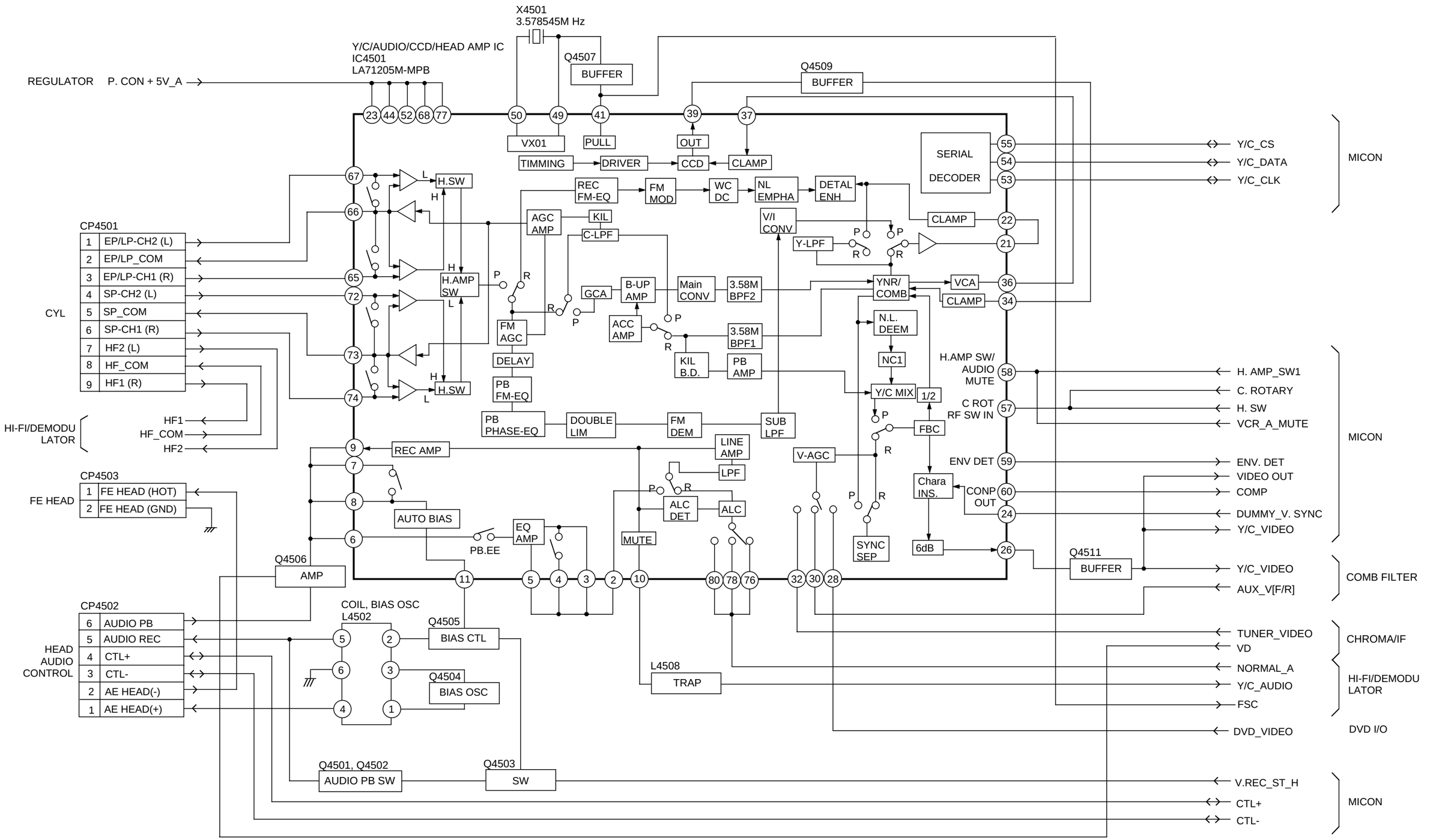
CC..... CERAMIC CAPACITOR
CE..... ALUMI ELECTROLYTIC CAPACITOR
CP..... POLYESTER CAPACITOR
CPP..... POLYPROPYLENE CAPACITOR
CPL..... PLASTIC CAPACITOR
CMP..... METAL POLYESTER CAPACITOR
CMPL..... METAL PLASTIC CAPACITOR
CMPP..... METAL POLYPROPYLENE CAPACITOR

DVD BLOCK DIAGRAM

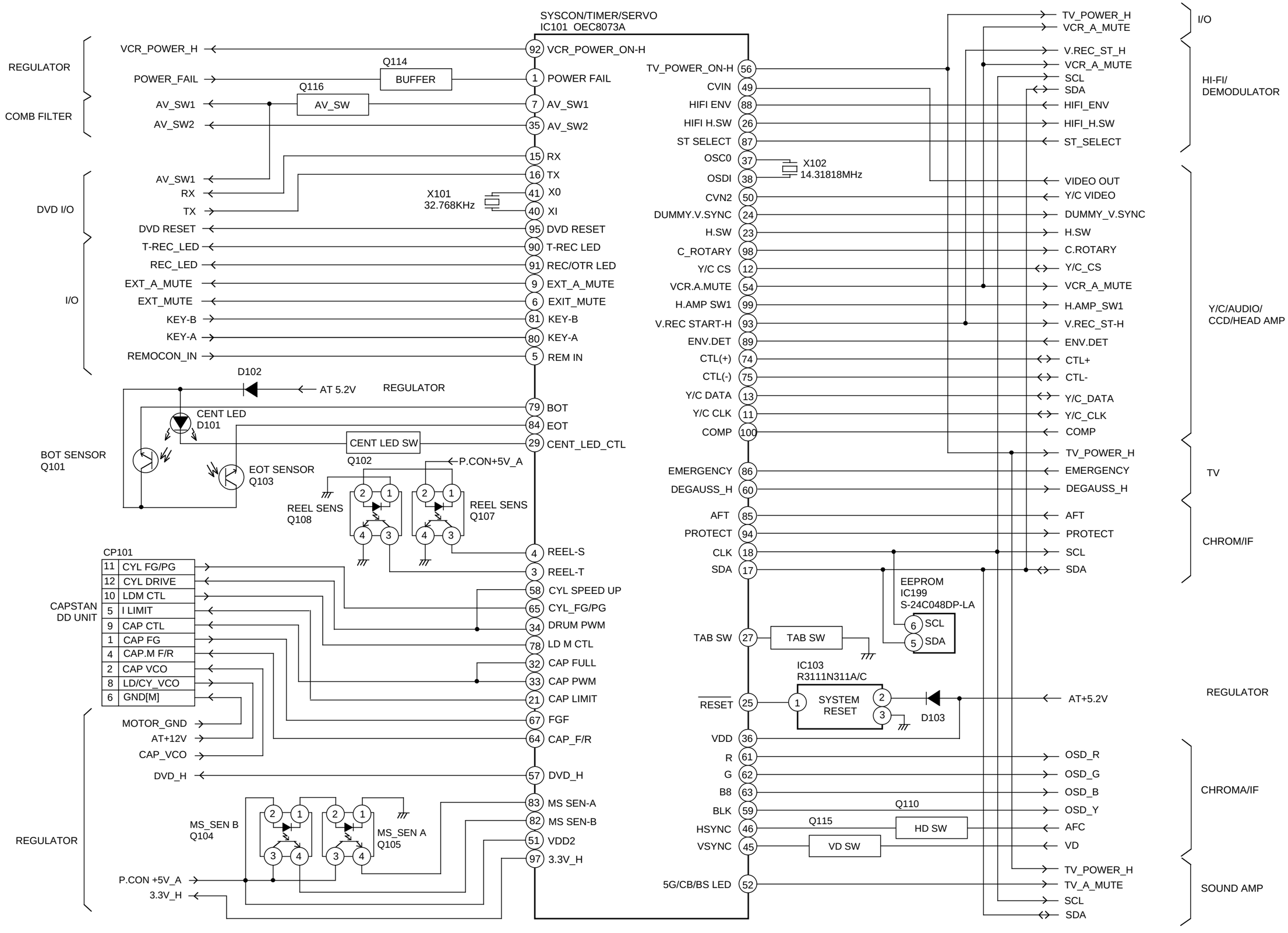


A---P.CON+D5V
B---P.CON+5V A
C---P.CON+3.3V
D---P.CON+9V
E---P.CON+5V D
F---P.CON+9V A

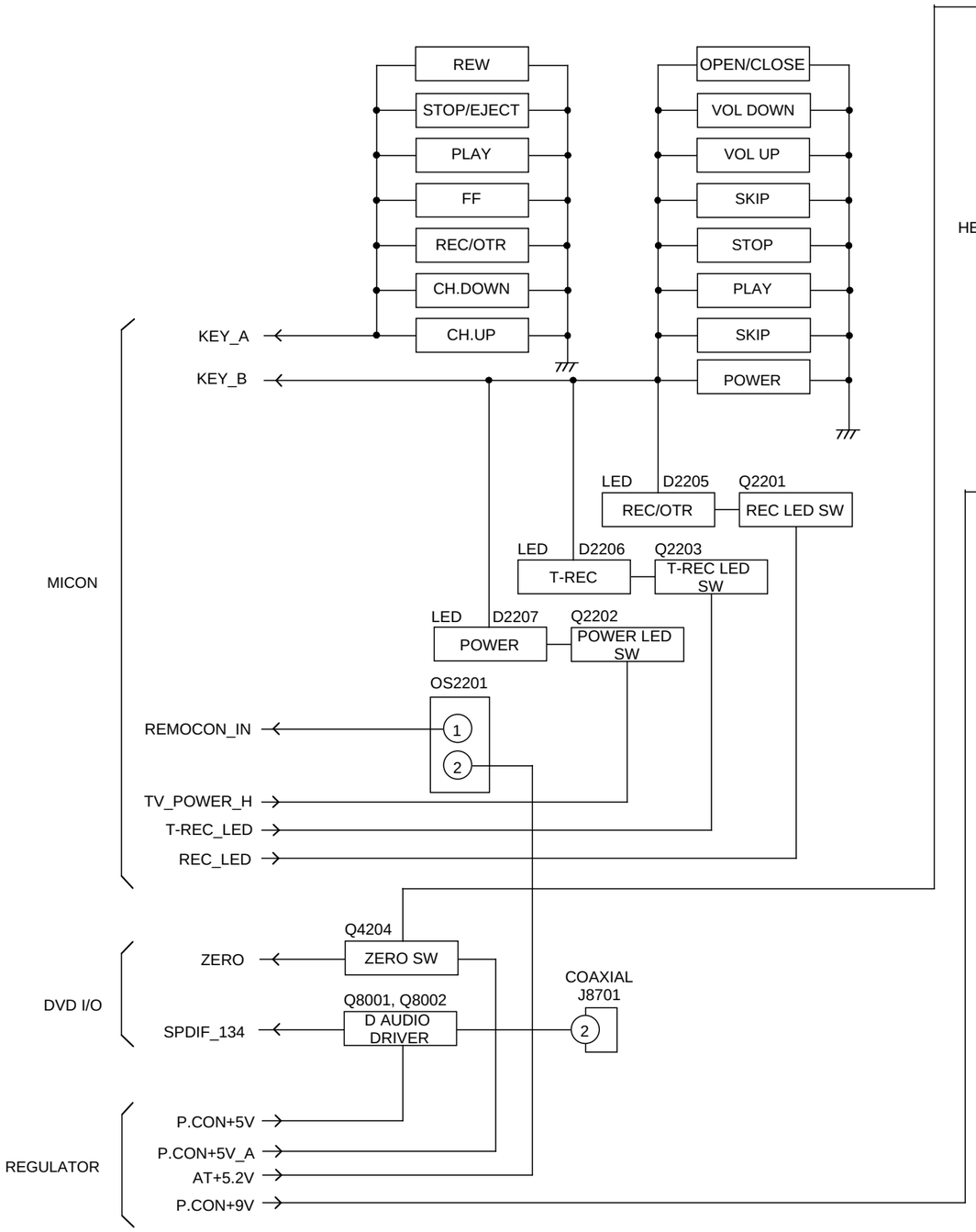
Y/C/AUDIO/CCD/HEAD AMP BLOCK DIAGRAM

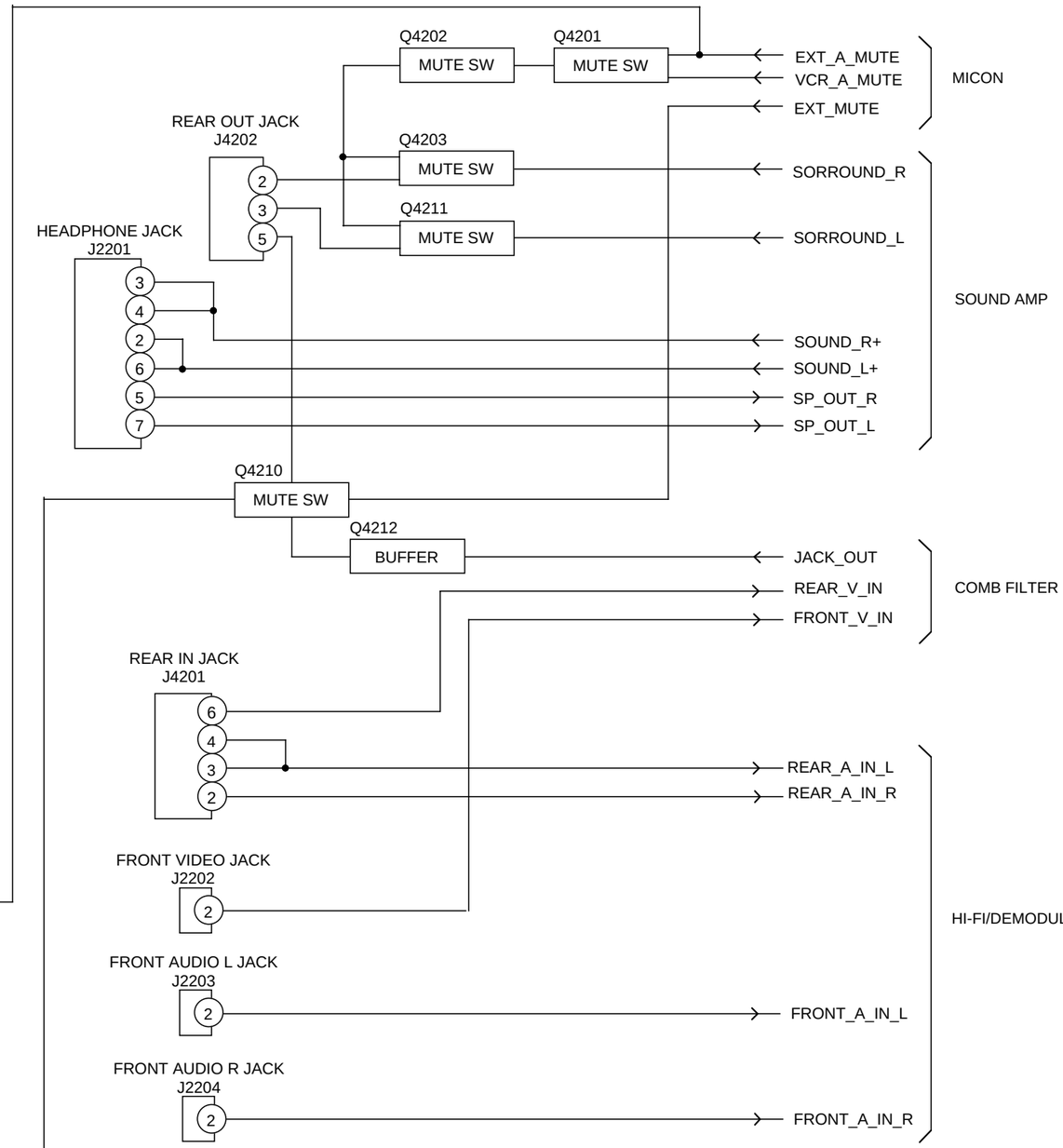


MICON BLOCK DIAGRAM

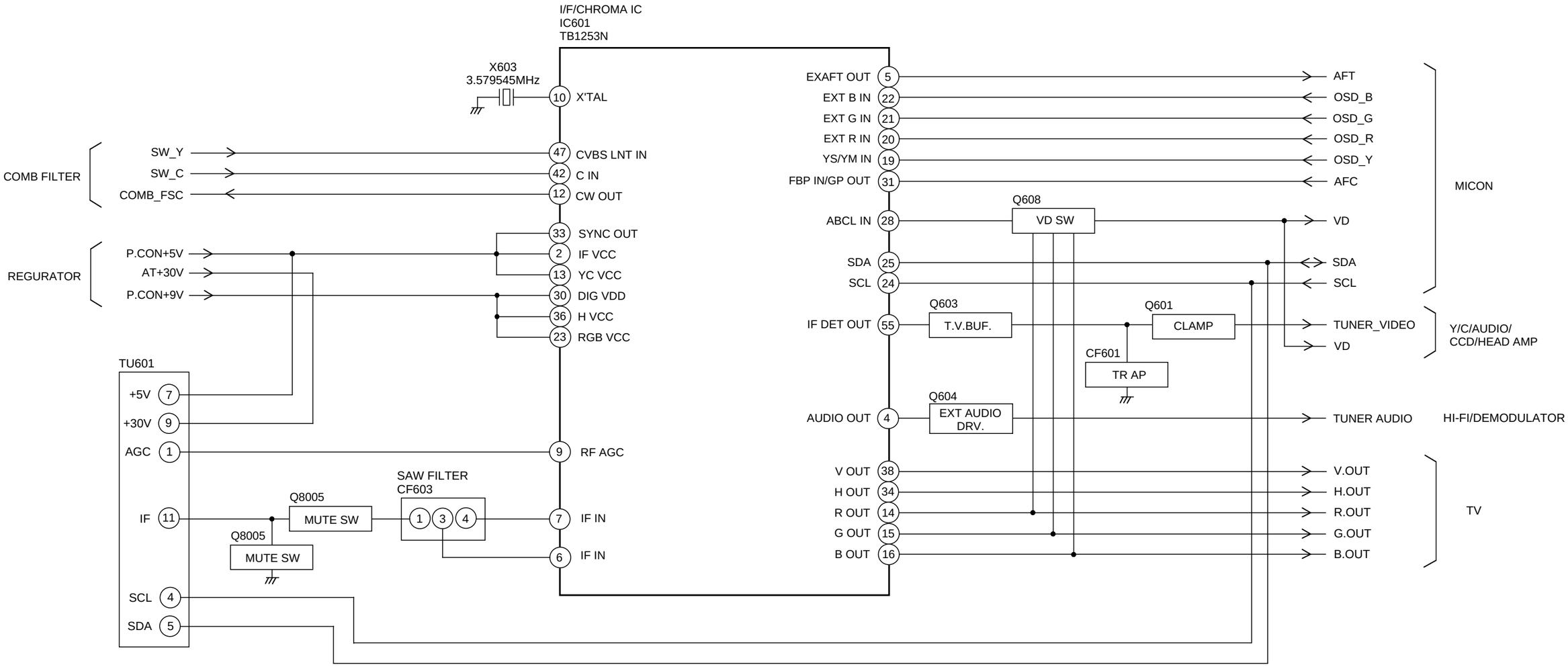


IN/OUT BLOCK DIAGRAM

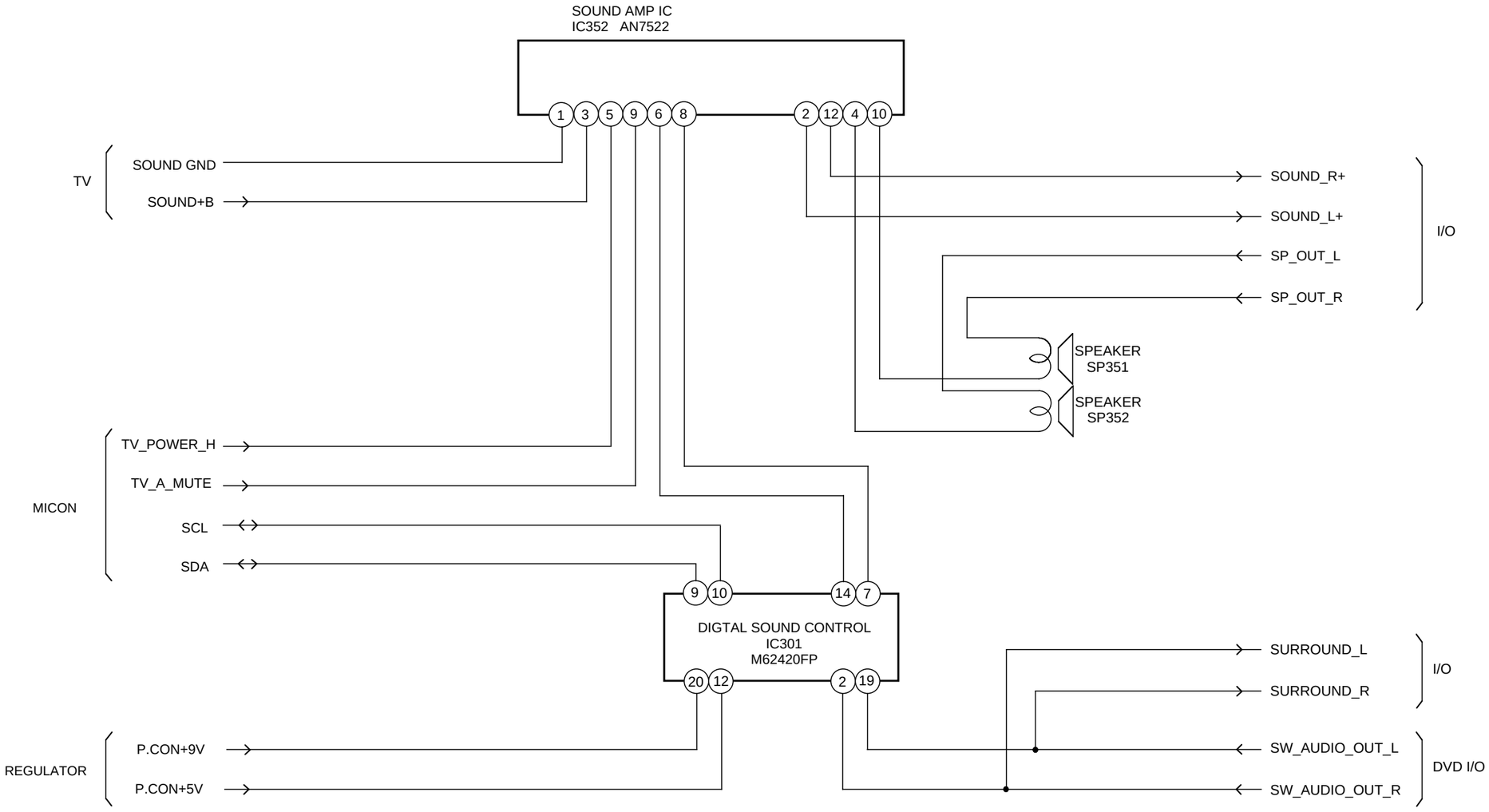




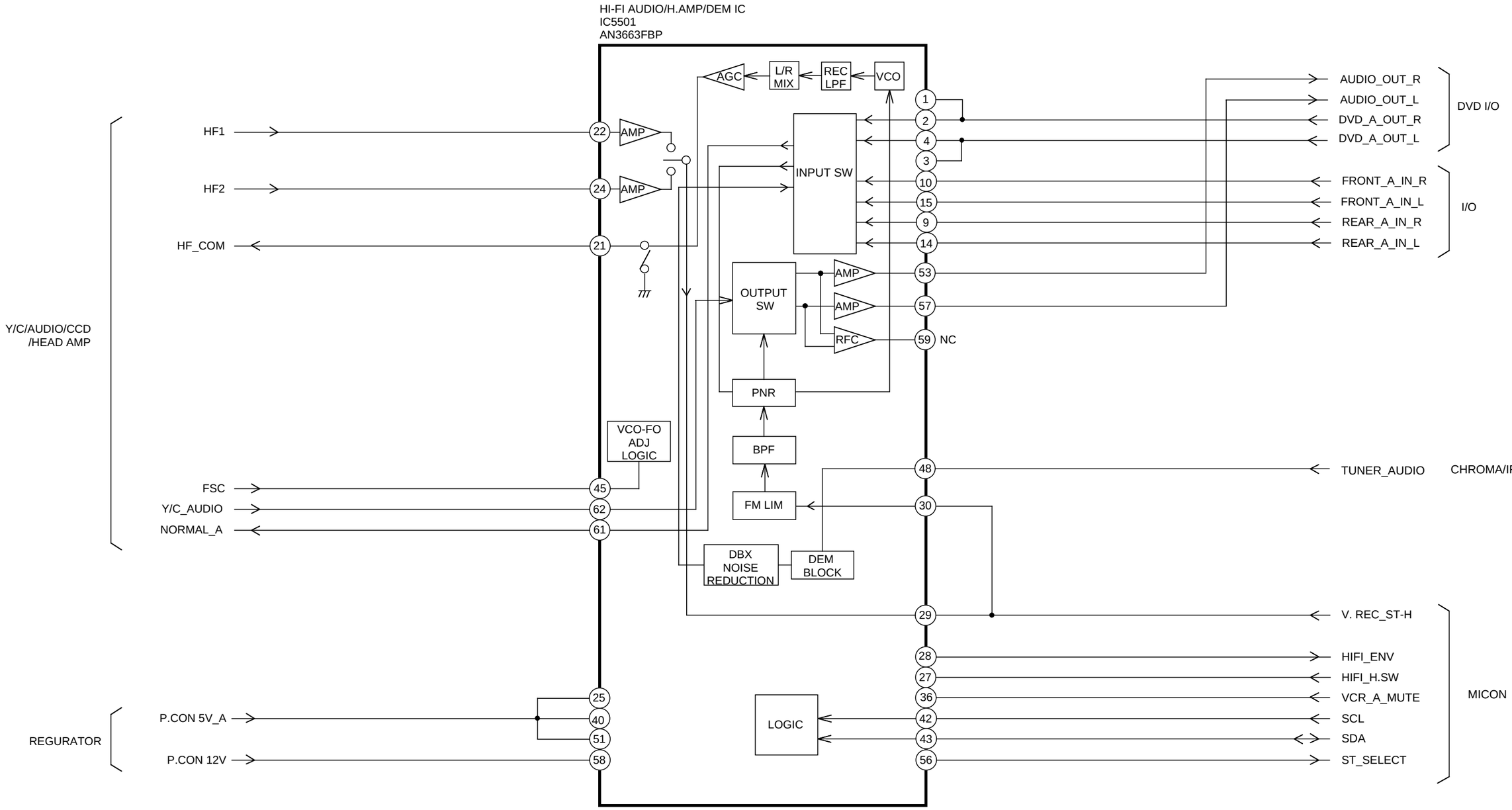
CHROMA/IF BLOCK DIAGRM



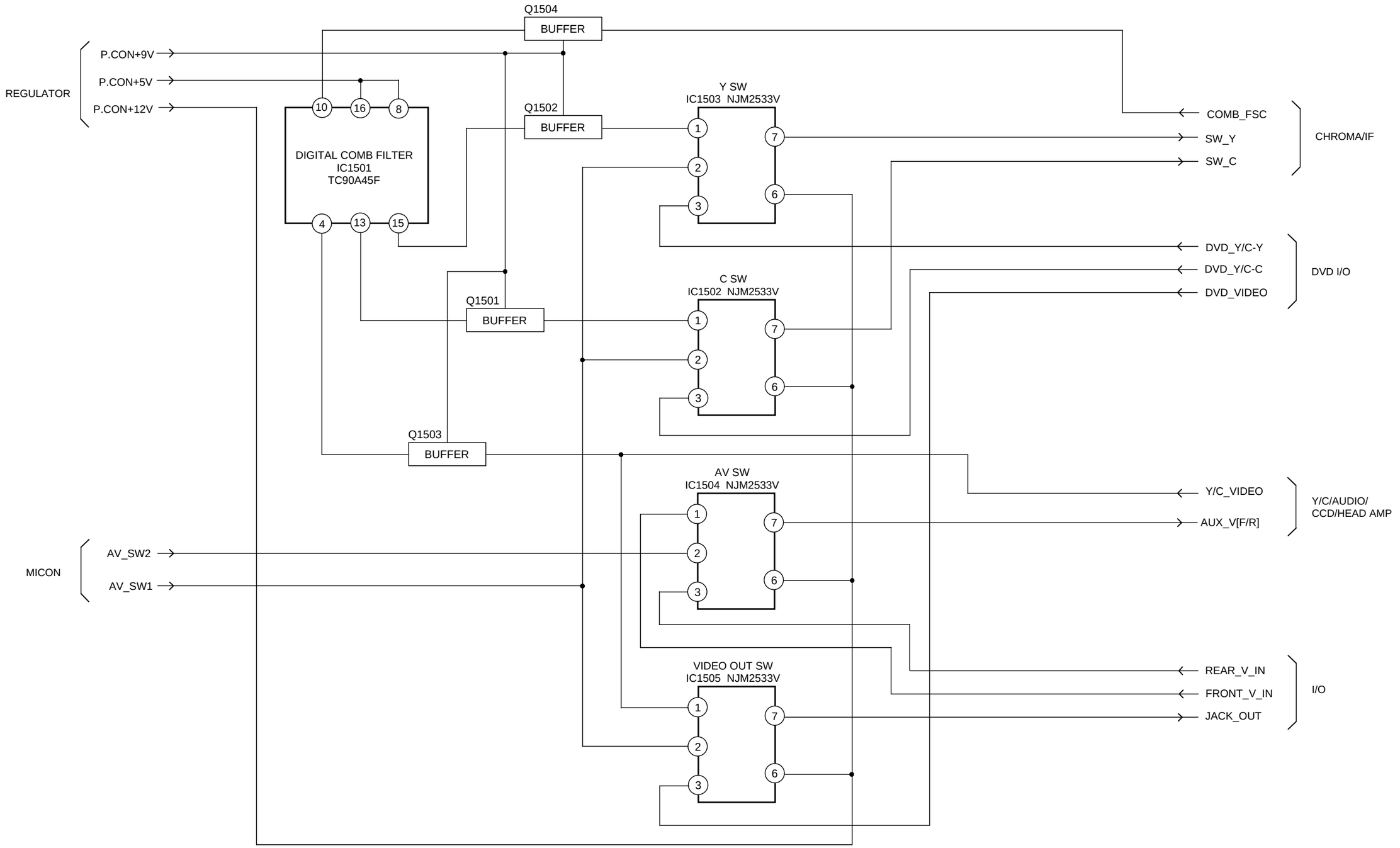
SOUND AMP BLOCK DIAGRAM



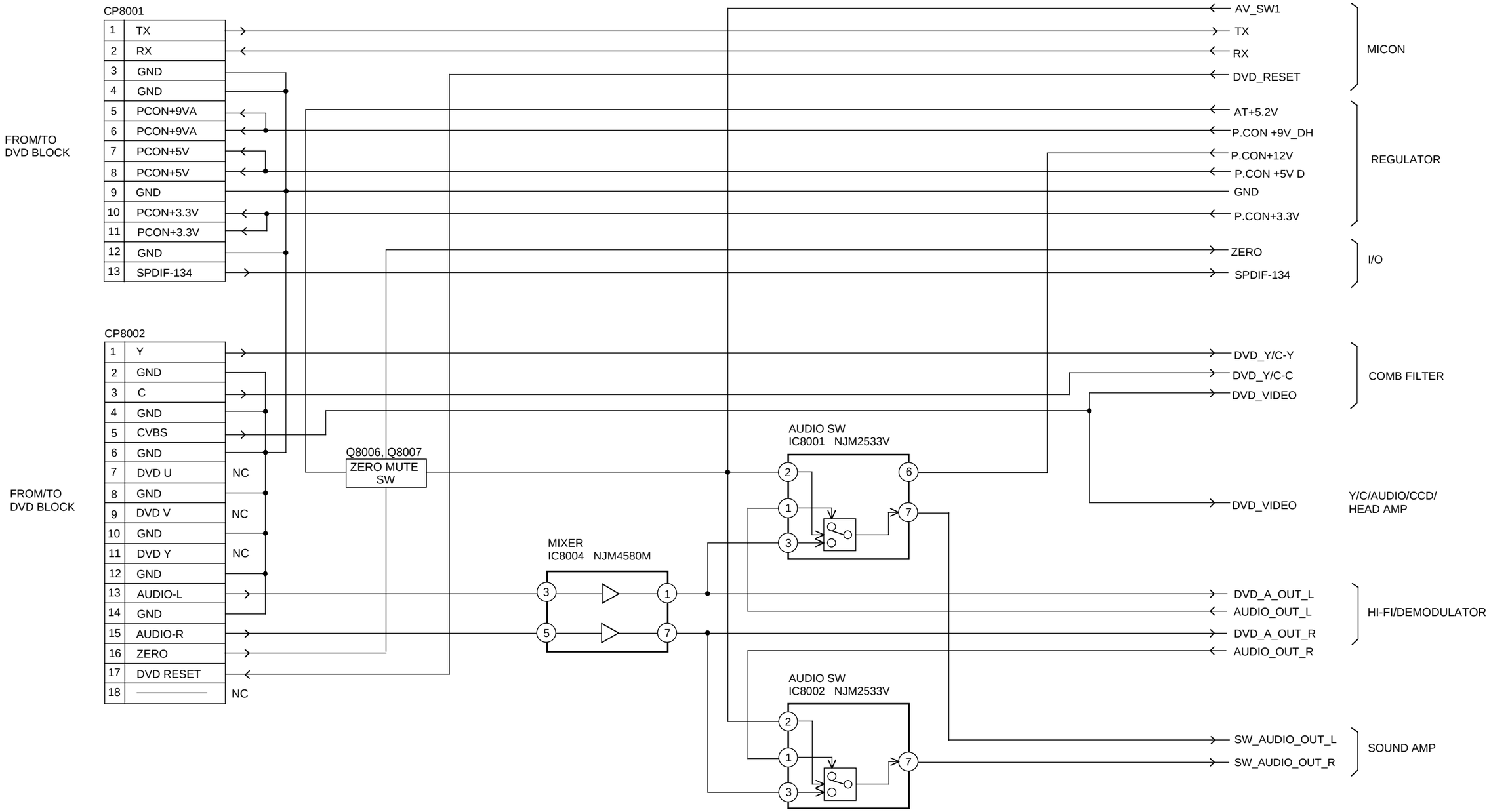
Hi-Fi/DEMODULATOR BLOCK DIAGRM



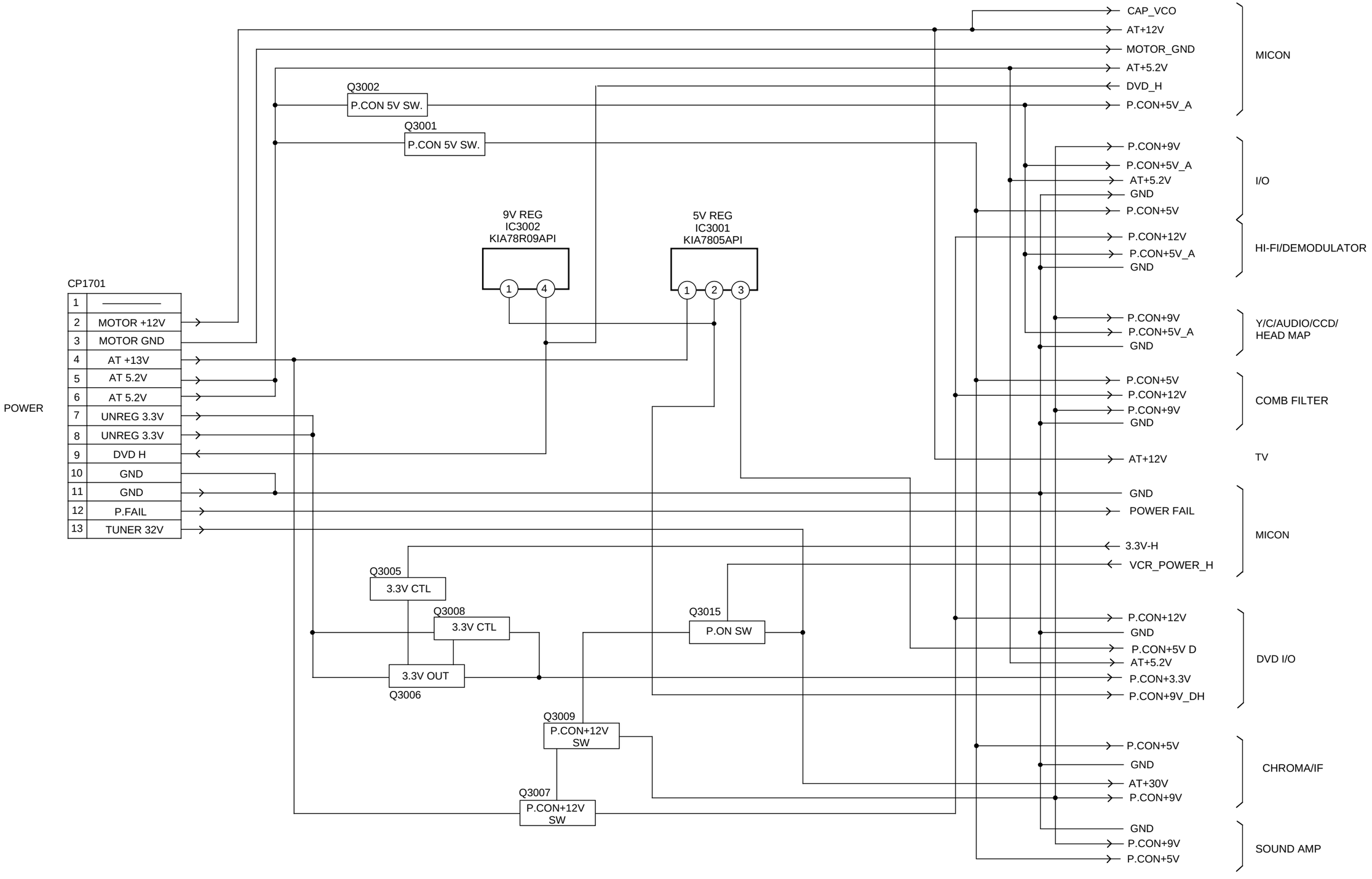
COMB FILTER BLOCK DIAGRAM



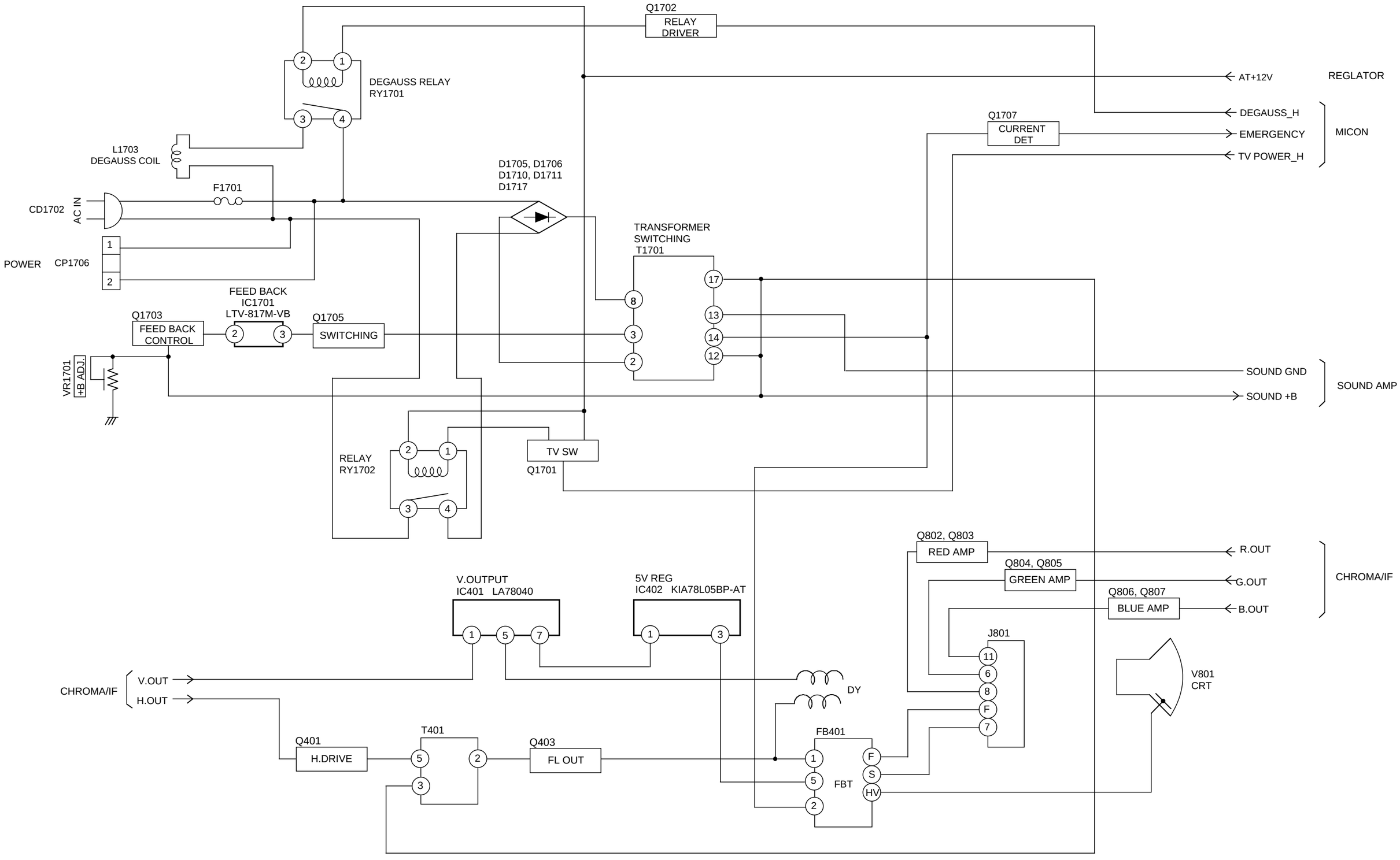
DVD IN/OUT BLOCK DIAGRAM



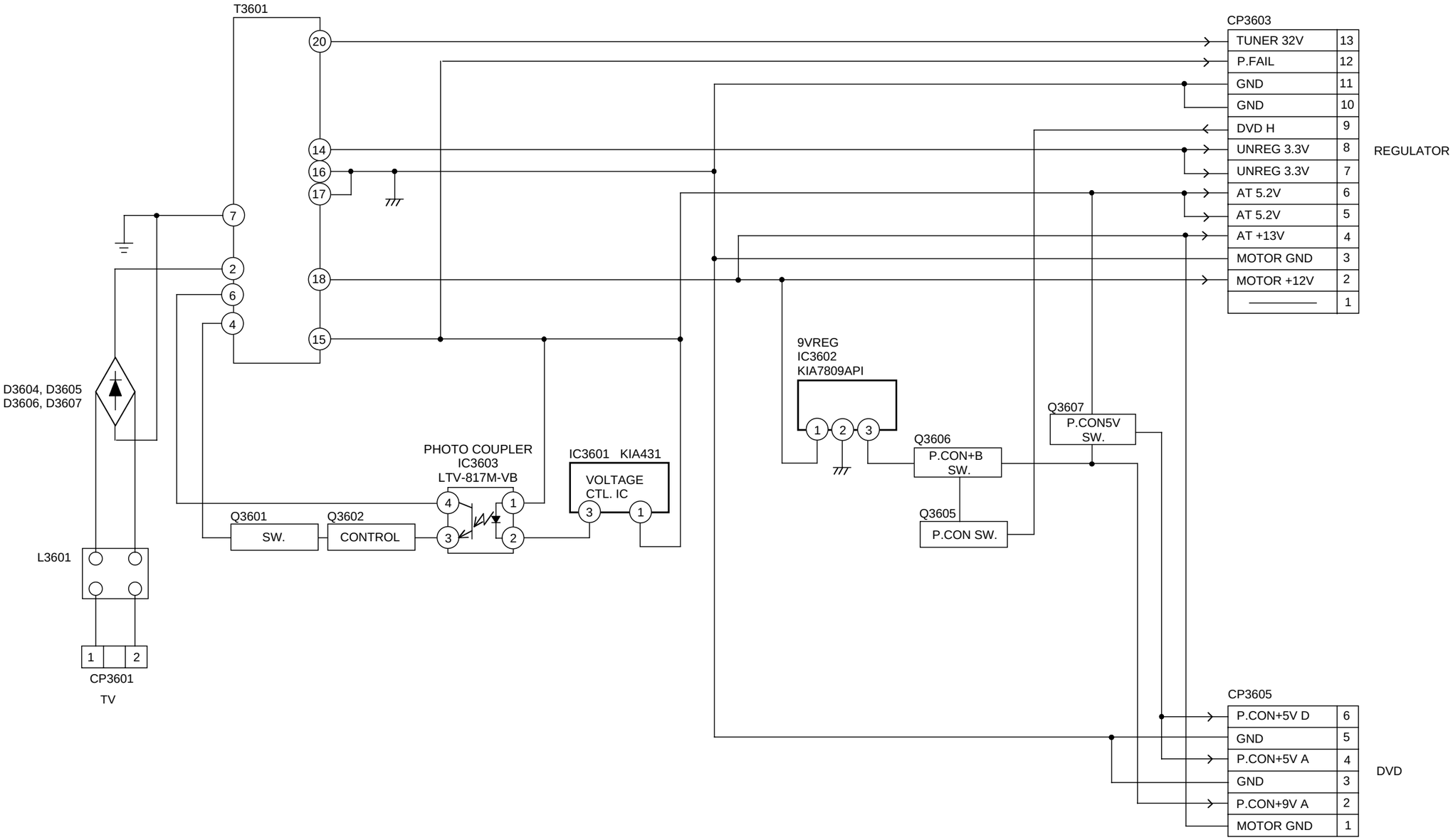
REGULATOR BLOCK DIAGRAM



TV BLOCK DIAGRAM

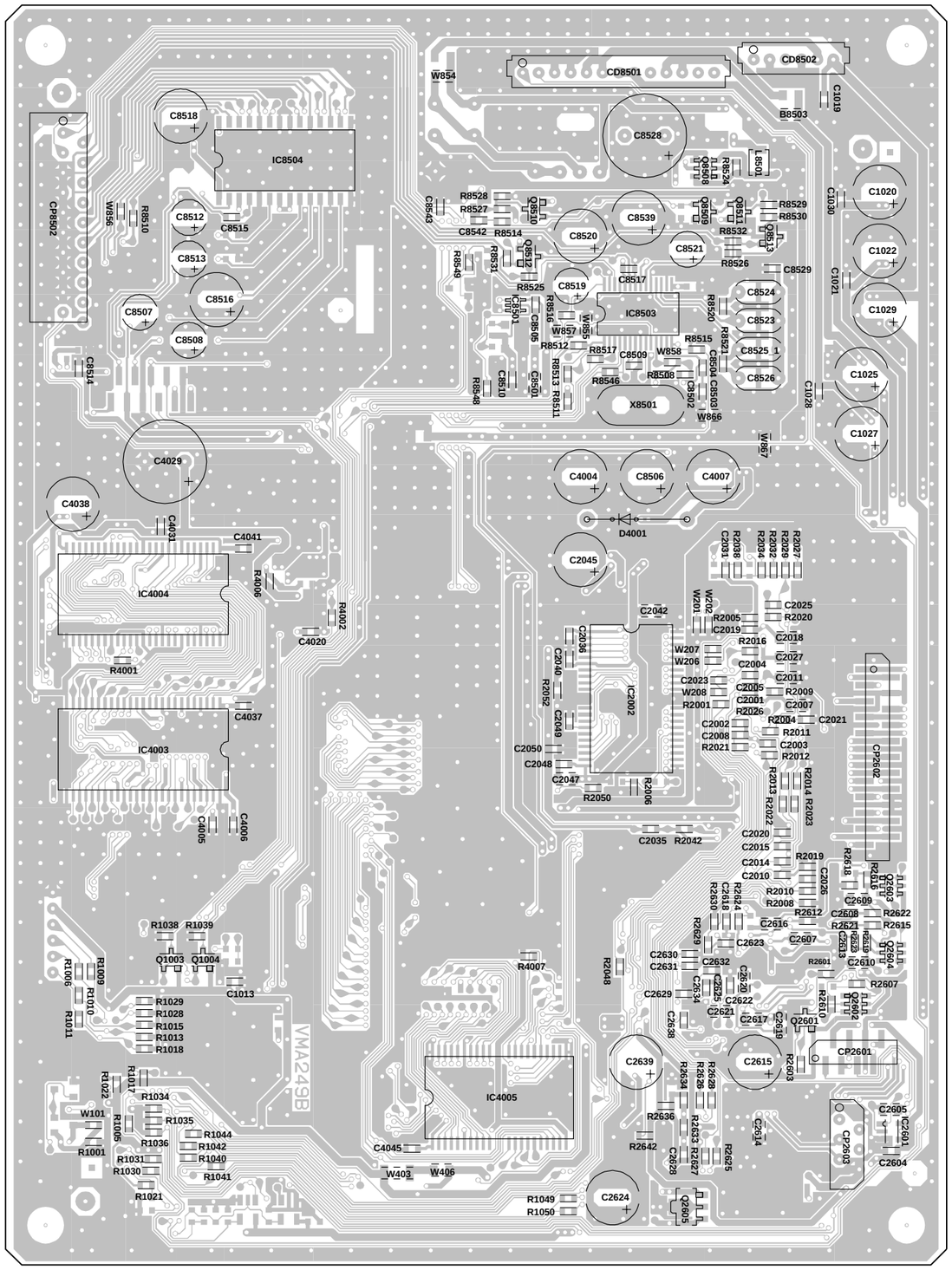


POWER BLOCK DIAGRAM

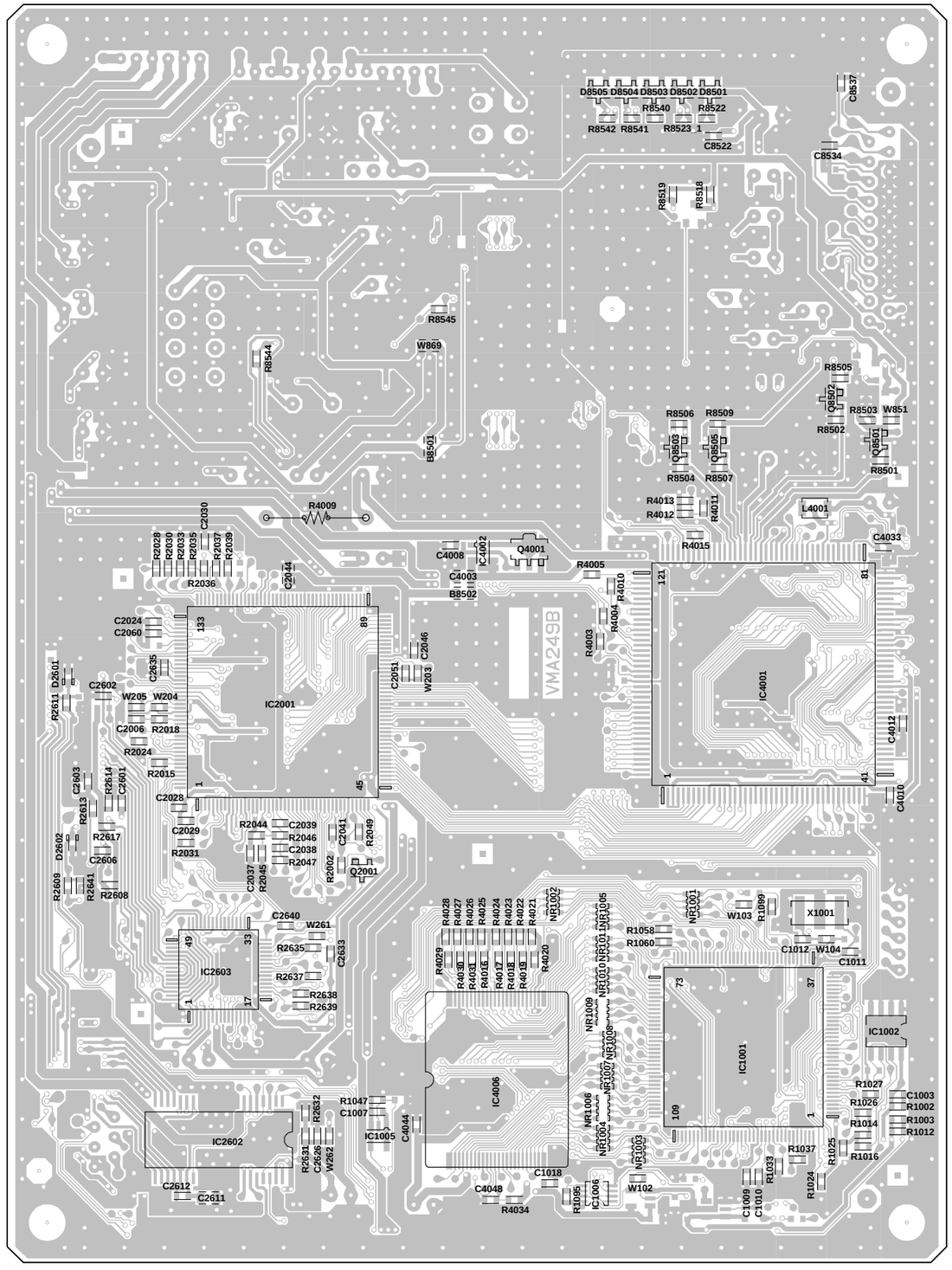


PRINTED CIRCUIT BOARDS

DVD (TOP SIDE)



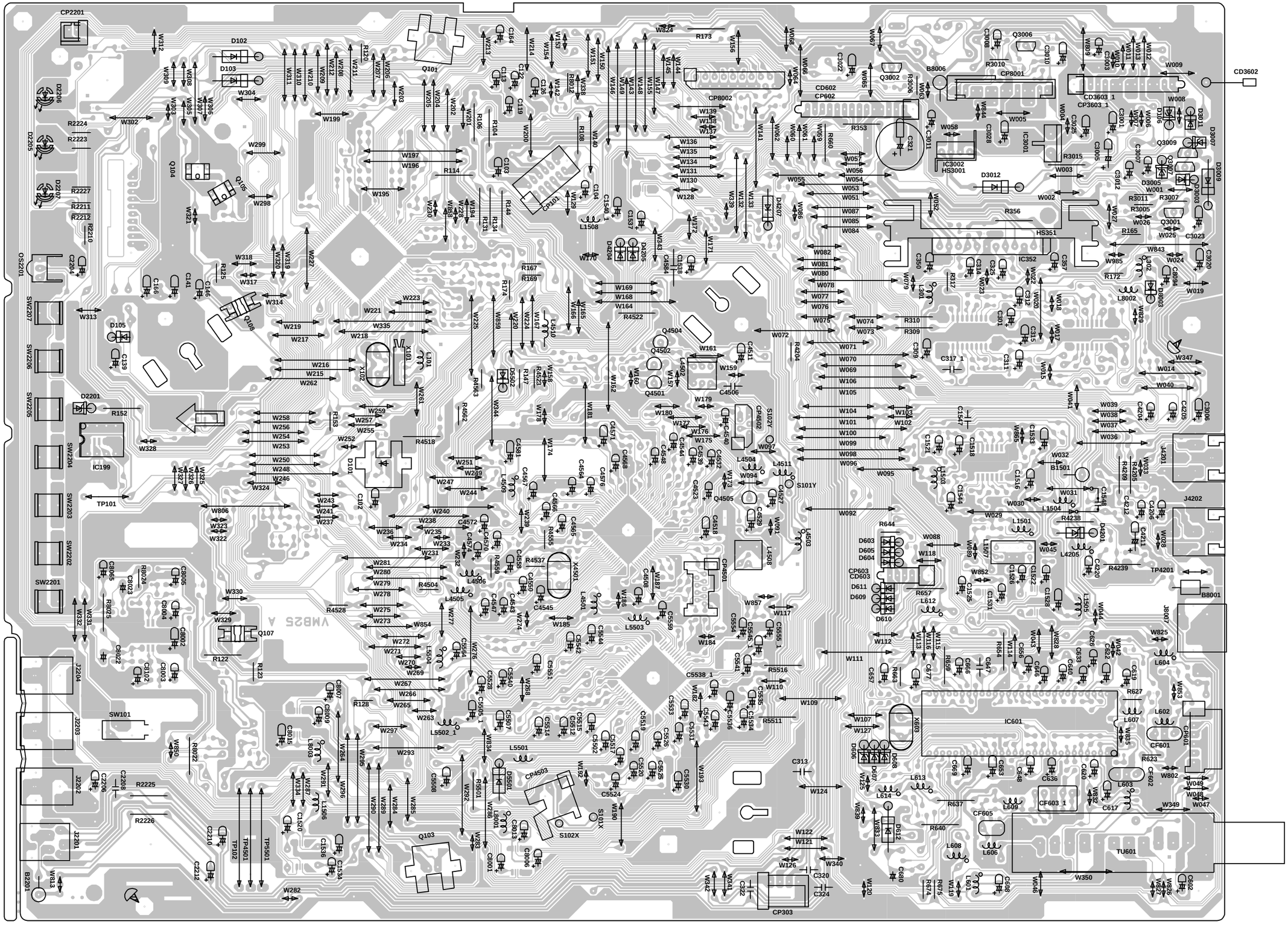
DVD (BOTTOM SIDE)



F-1

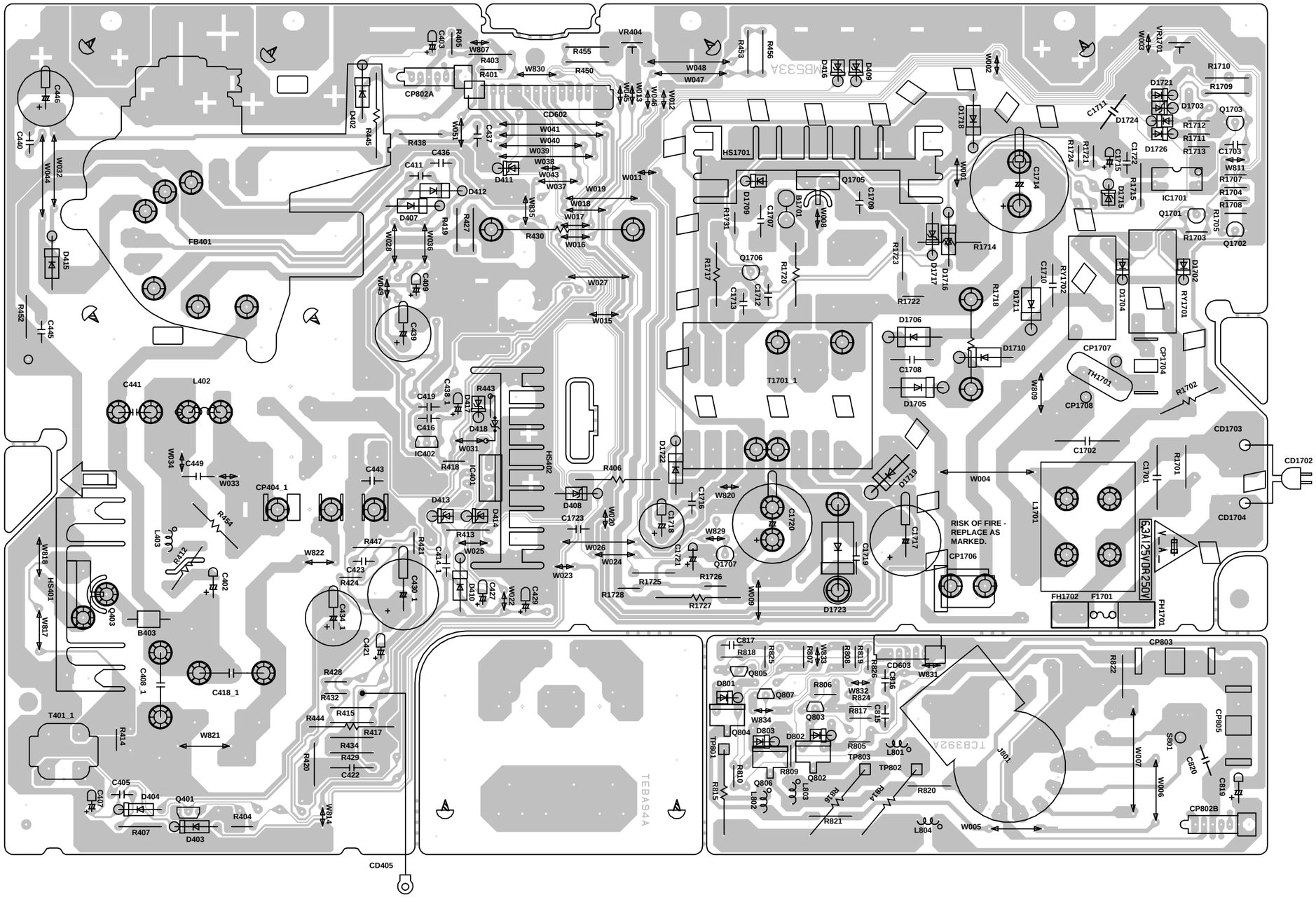
F-2

PRINTED CIRCUIT BOARDS
VCR (INSERTED PARTS)
SOLDER SIDE



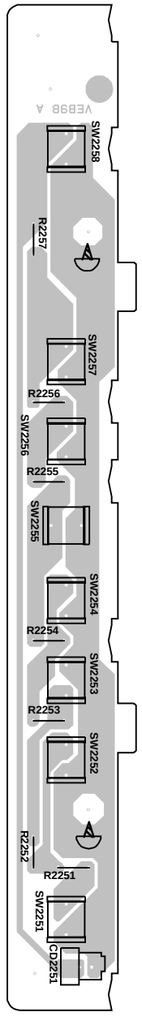
PRINTED CIRCUIT BOARDS
VCR (CHIP MOUNTED PARTS)
SOLDER SIDE

PRINTED CIRCUIT BOARDS
MAIN/CRT
SOLDER SIDE

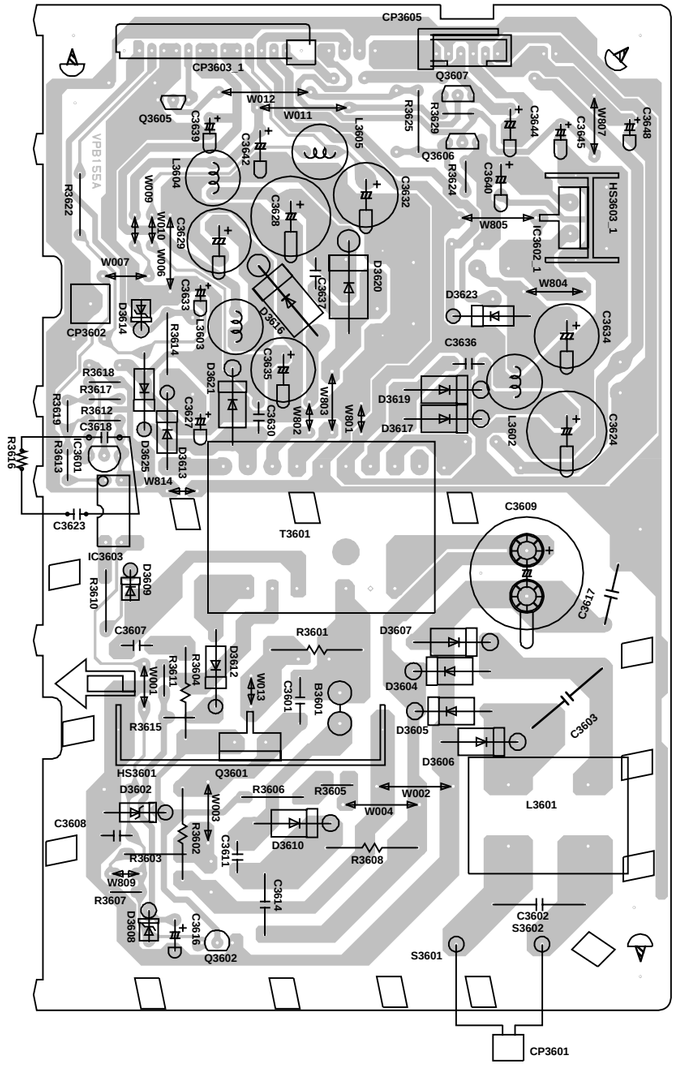


PRINTED CIRCUIT BOARDS

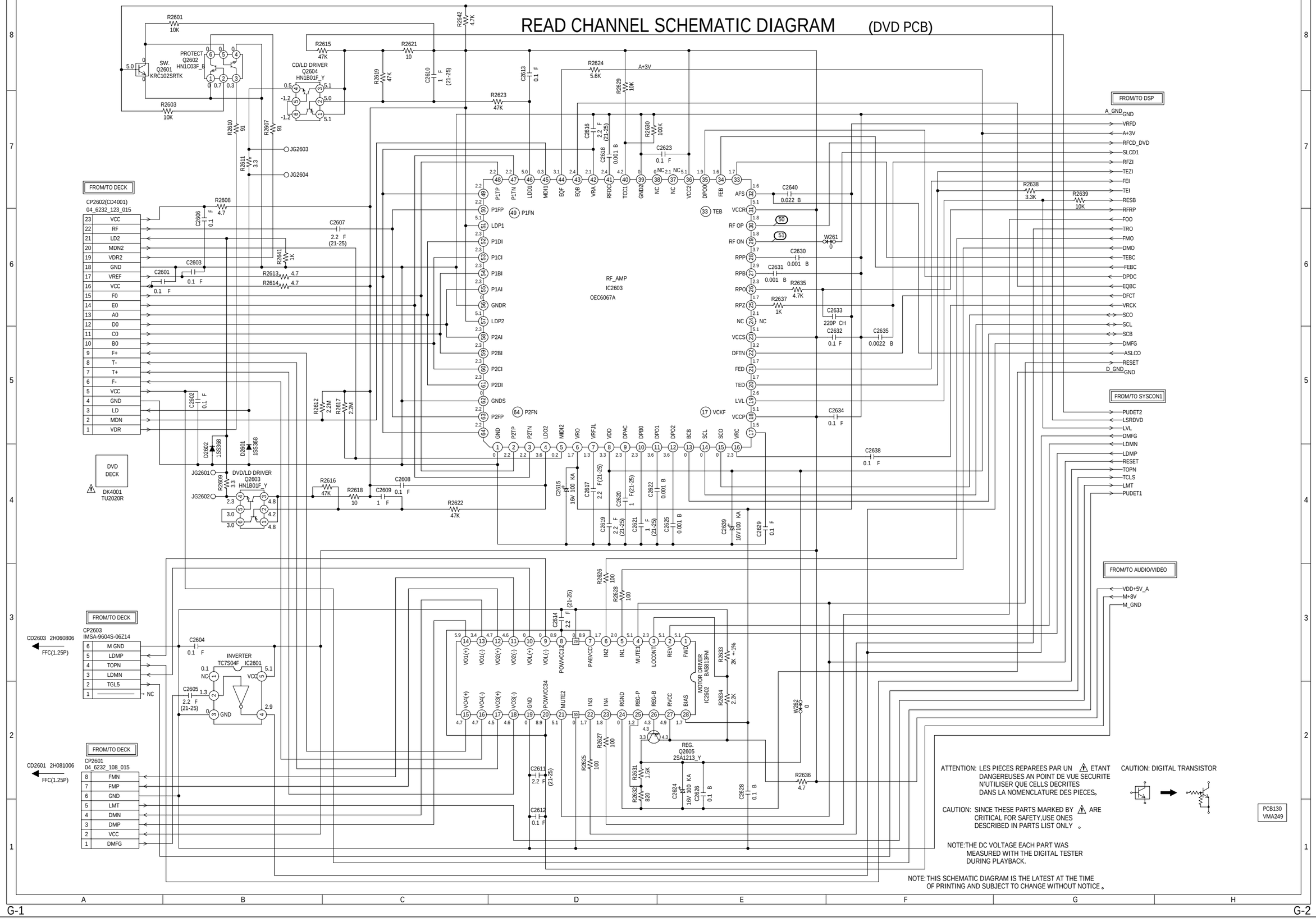
OPERATION
SOLDER SIDE



POWER
SOLDER SIDE

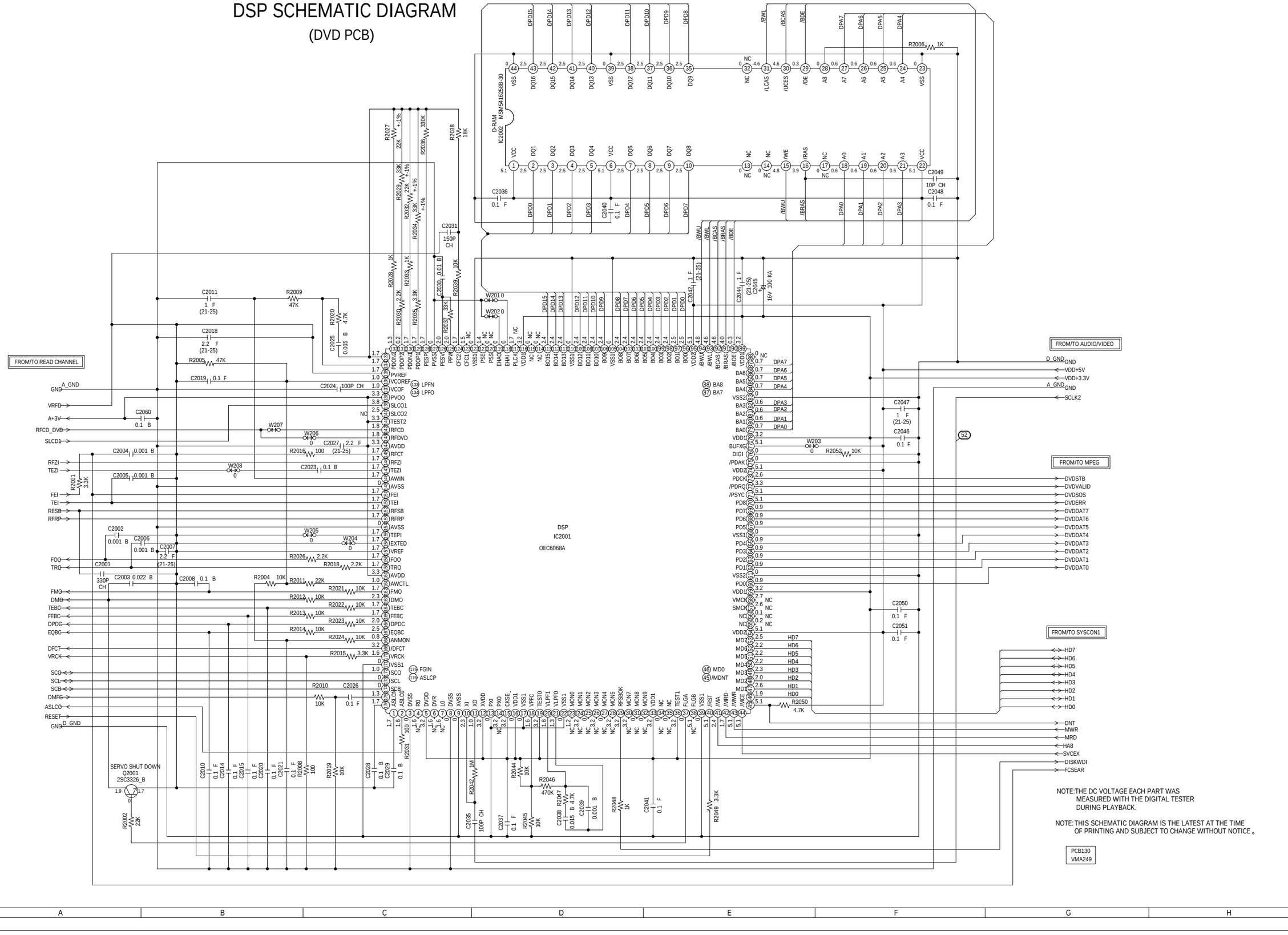


READ CHANNEL SCHEMATIC DIAGRAM (DVD PCB)

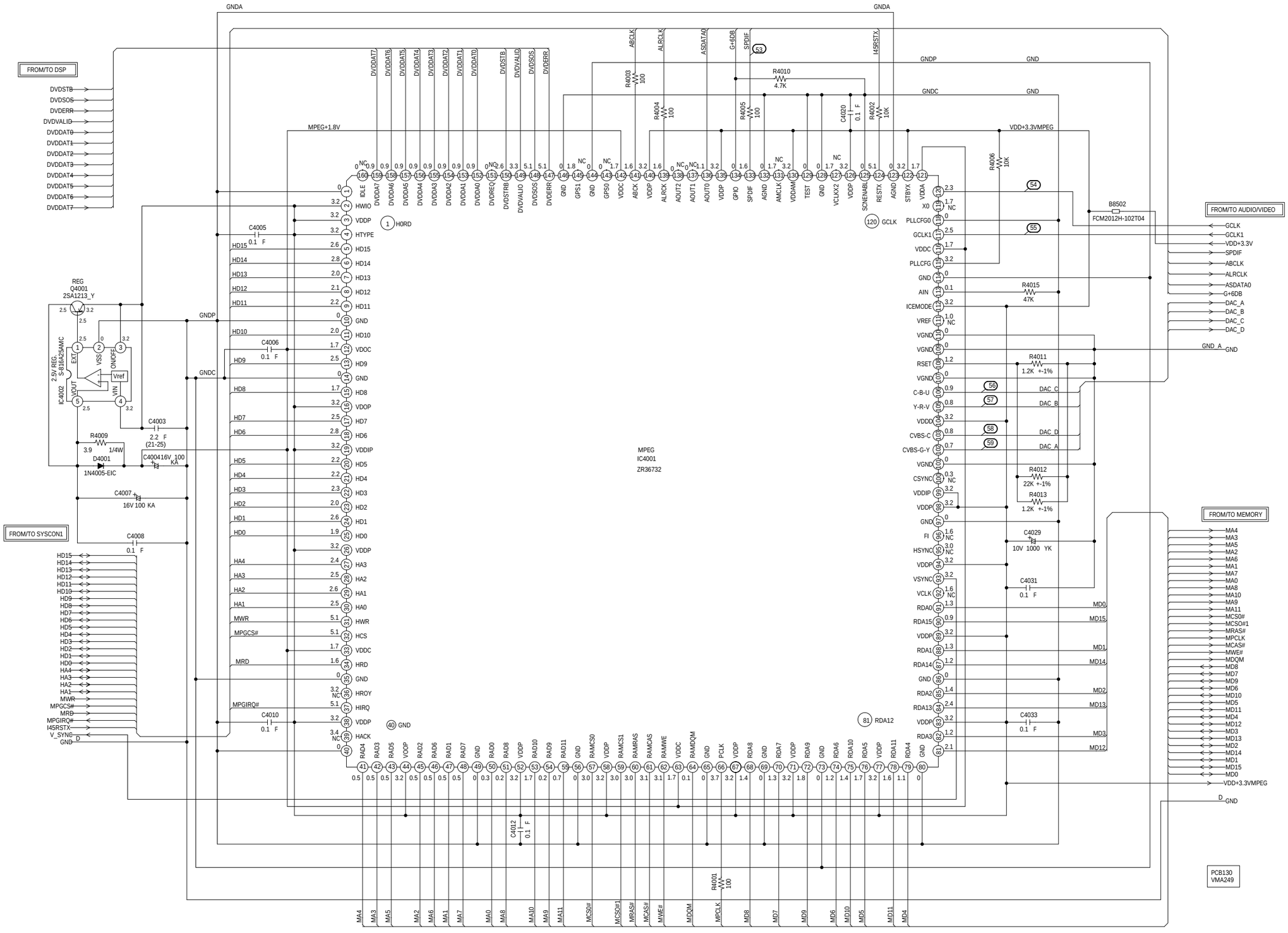


DSP SCHEMATIC DIAGRAM

(DVD PCB)



MPEG SCHEMATIC DIAGRAM (DVD PCB)

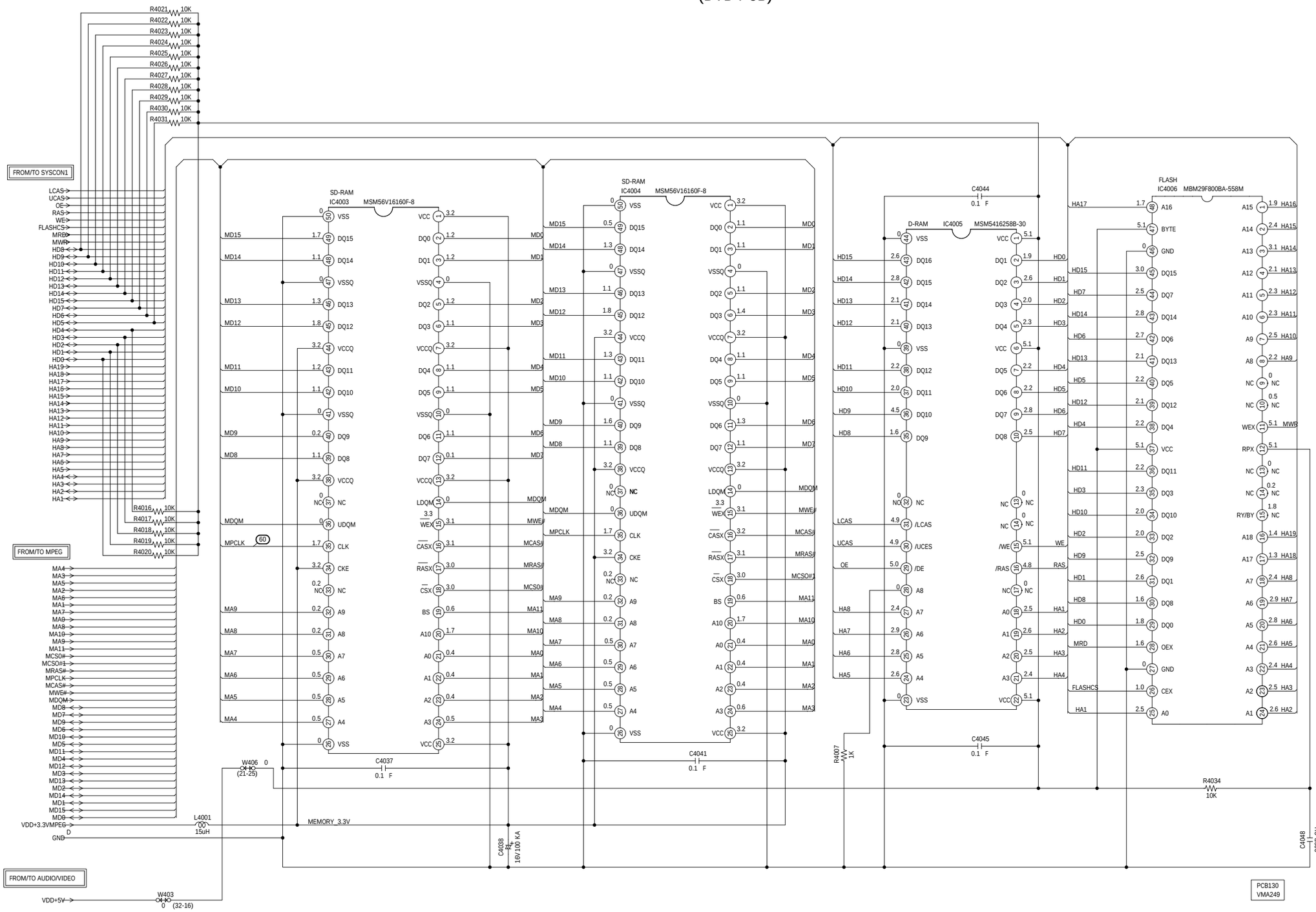


NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

MEMORY SCHEMATIC DIAGRAM

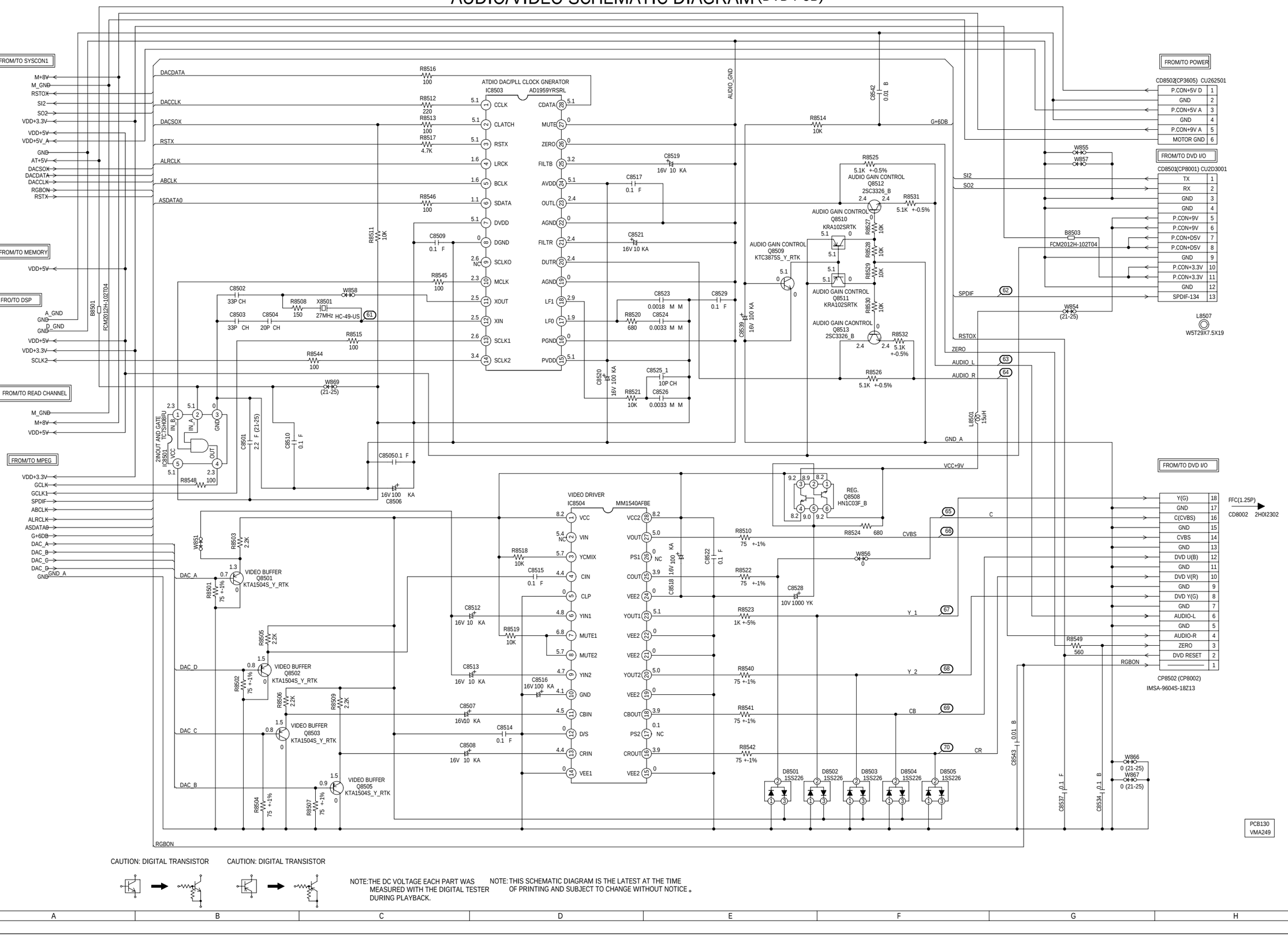
(DVD PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

AUDIO/VIDEO SCHEMATIC DIAGRAM (DVD PCB)



CAUTION: DIGITAL TRANSISTOR

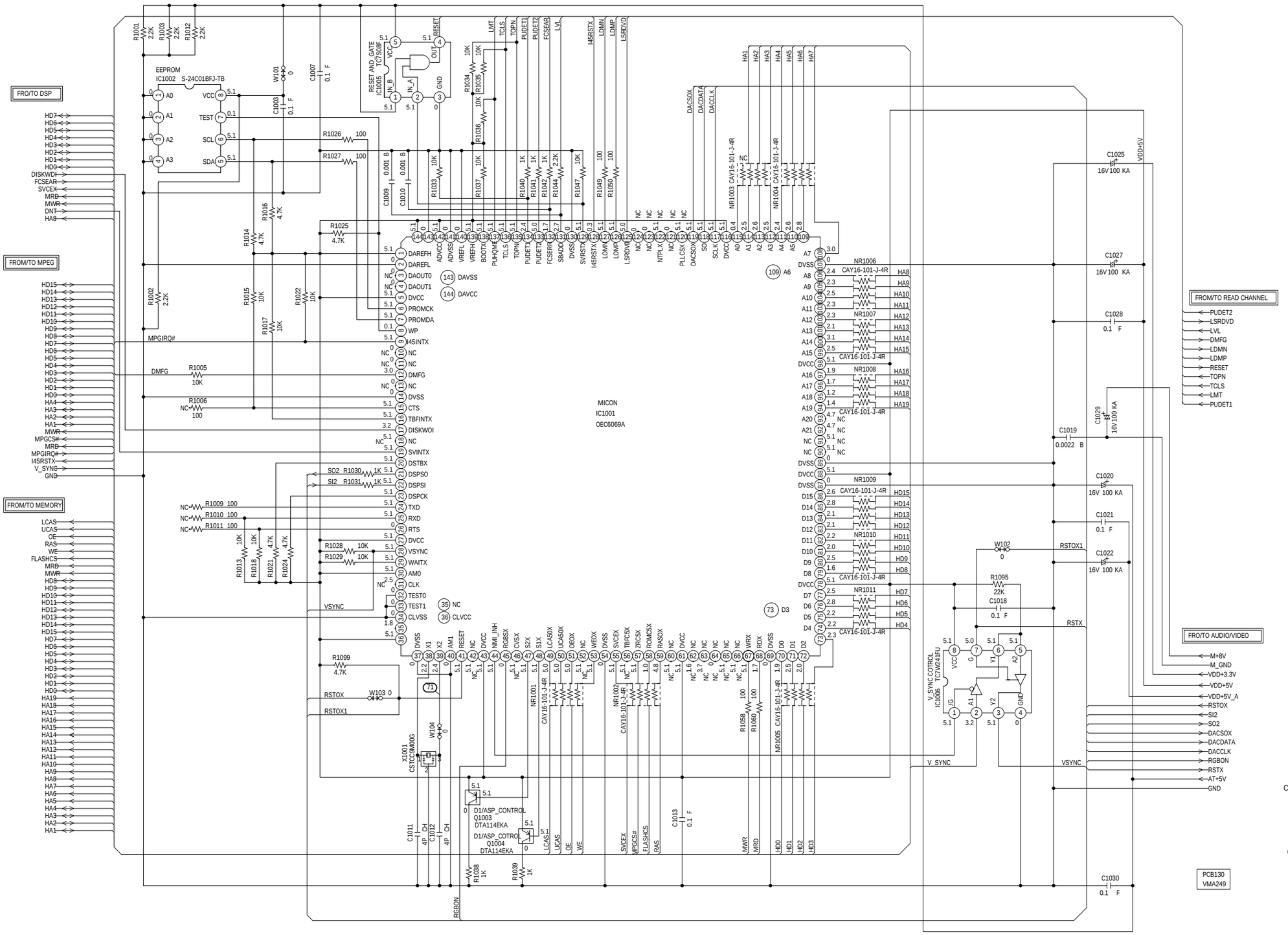
CAUTION: DIGITAL TRANSISTOR

NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

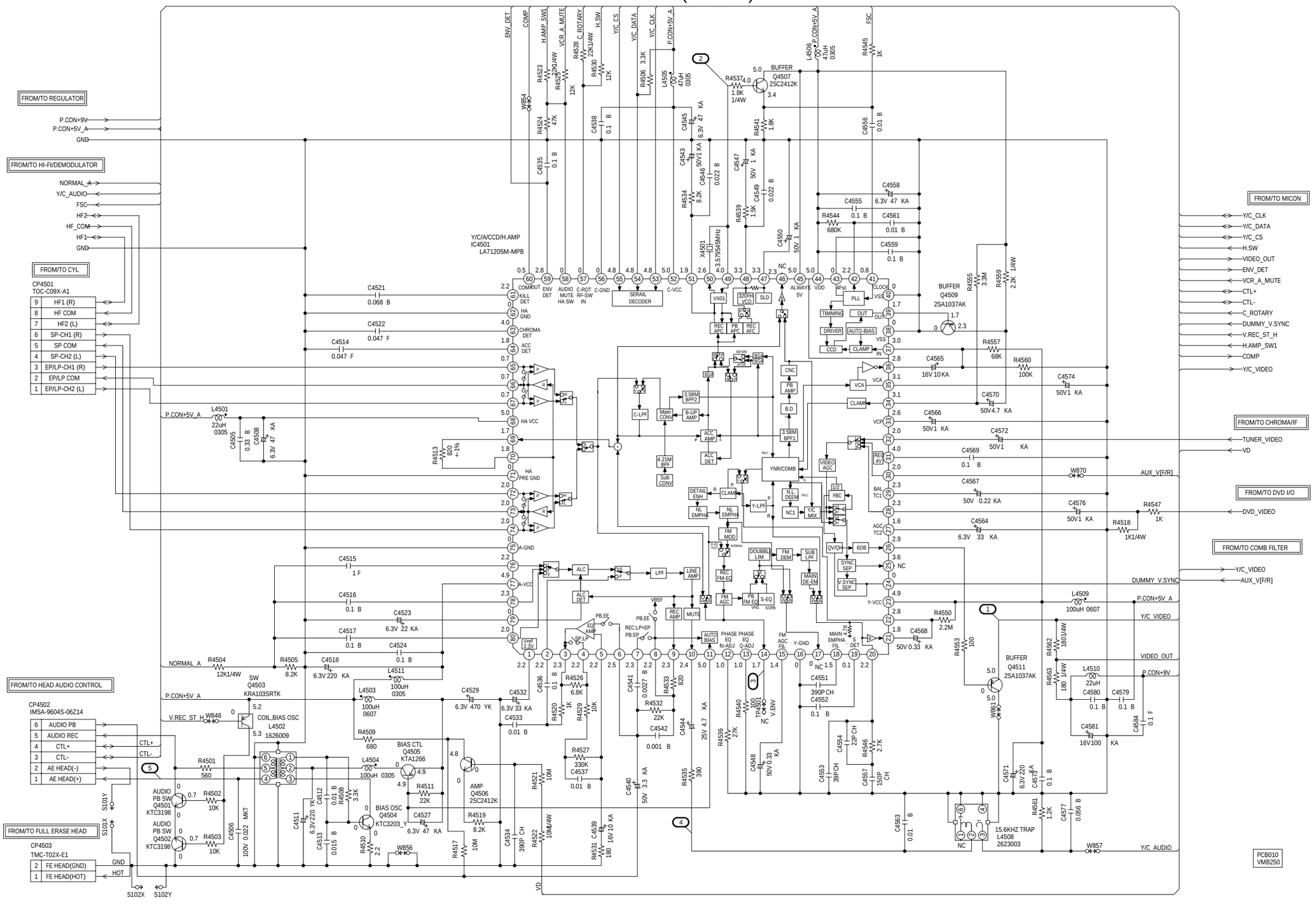
SYSCON1 SCHEMATIC DIAGRAM

(DVD PCB)



Y/C/AUDIO/CCD/HEAD AMP SCHEMATIC DIAGRAM

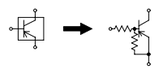
(VCR PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

CAUTION: DIGITAL TRANSISTOR



MICON SCHEMATIC DIAGRAM (VCR PCB)

FROM/TO REGULATOR
AT+5.2V
POWER_FAIL
VCR_POWER_H
CAP_VCC
AT+12V
P.CON+5V_A
3.3V_H
DVD_H
GND
MOTOR_GND

FROM/TO Y/C/A/CCD/H.AMP
Y/C_VIDEO
Y/C_CLK
Y/C_DATA
Y/C_CS
H.SW
VIDEO_OUT
ENV_DET
VCR_A_MUTE
CTL+
CTL-
C_ROTARY
DUMMY_V.SYNC
V.REC_ST_H
H.AMP_SW1
COMP

FROM/TO CAPSTAN DD UNIT
CP101
TMC-J12P-B2
1 CAP FG
2 CAP VCO
3 VCC
4 CAP.M F/R
5 I LIMIT
6 MOTOR GND
7 GND
8 LD/CY VCO
9 CAP CTL
10 LDM CTL
11 CYL FG/PG
12 CYL CTL

SYSCON/TIMER/SERVO
IC101
OEC8073A

51: VDD2
52: AFCC
25:RESET
24:DUMMY.V.SYNC
98:C_ROTARY
99:H.AMP.SW1
100:COMP
76:CO
77: NC

FROM/TO DVD I/O
TX
RX
DVD_RESET
AV_SW1

FROM/TO I/O
KEY_B
KEY_A
REC_LED
T-REC_LED
REMOCON_IN
EXT_A_MUTE
VCR_A_MUTE
EXT_MUTE
TV_POWER_H

FROM/TO CHROMA/IF
OSD_R
OSD_G
OSD_B
OSD_Y
AFC
VD
H_CONTROL
DEGAUSS_H
SDA
SCL
AFT
TV_POWER_H
PROTECT
IIC_OFF
EMERGENCY

FROM/TO HI-FI/DEMODULATOR
V.REC_ST_H
HIFI_ENV
HIFI_H.SW
VCR_A_MUTE
SDA
SCL
ST_SELECT

FROM/TO SOUND AMP
TV_POWER_H
TV_A_MUTE
SCL
SDA

FROM/TO COMB FILTER
AV_SW1
AV_SW2

BOT SENSOR Q101 ST-304L
EOT SENSOR Q103 ST-304L
D101 LNA270L010R
CENT LED SW Q102 KRC103SRTK
TAB SW SW101 MXS01380MPR0
SW Q106 KRC103SRTK
MS_SEN B Q104 RPI-352C40N
MS_SEN A Q105 RPI-352C40N
REEL SENSOR Q107 RPI-303
REEL SENSOR Q108 RPI-303
SW Q117 2SC2412K
EEP ROM IC IC199 S-24C04BDP-LA
AV_SW Q116 2SC2412K
VD SW Q115 2SC2412K
HD SW Q110 2SC2412K
BUFFER Q114 2SA1037AK
SYSTEM RESET IC103 R3111N311A/C
D103 BACKUP+5V
D102 SB140-EIC
D105 1SS133
D106 MTZJ20B

CAUTION: DIGITAL TRANSISTOR

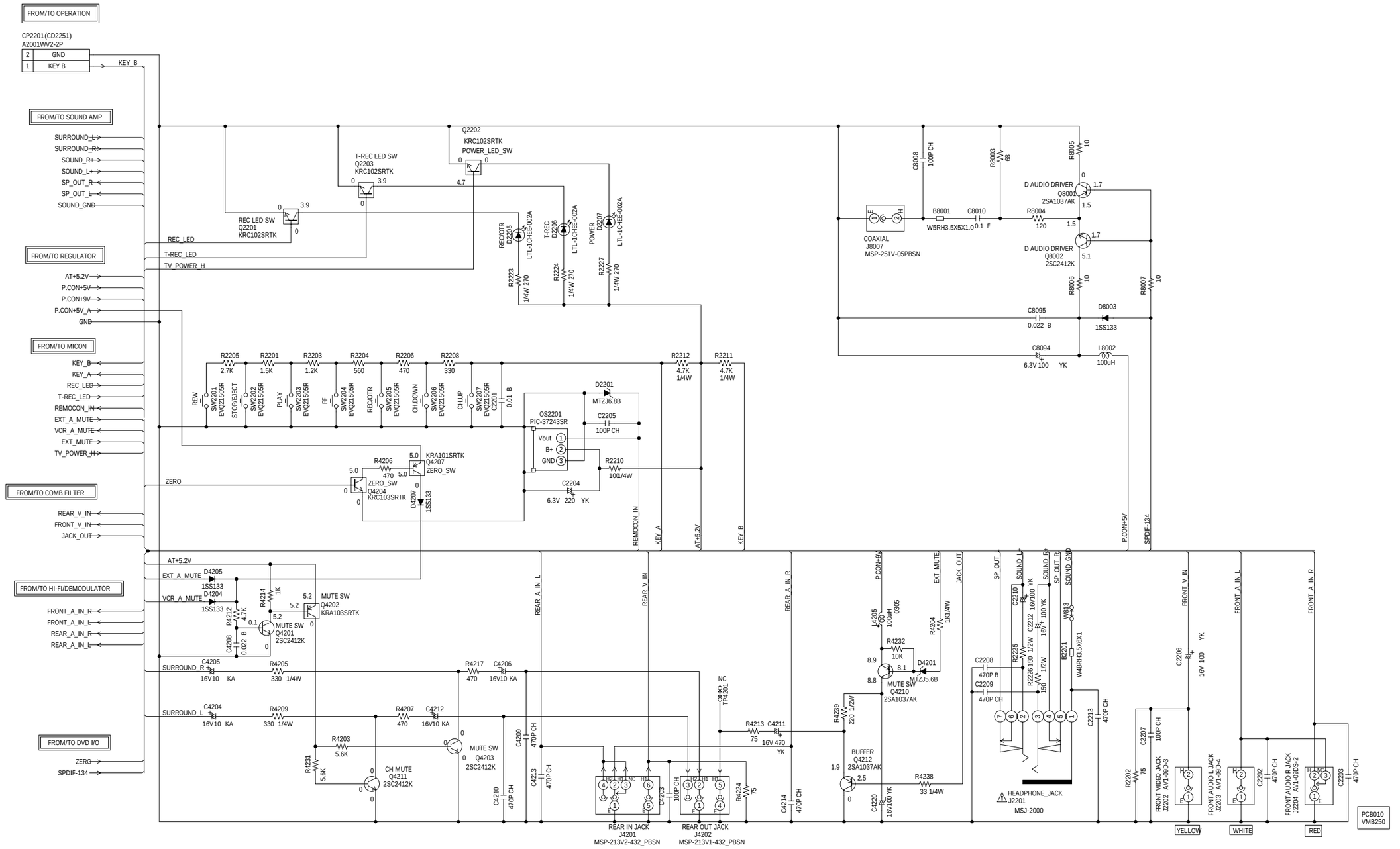
NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

PCB010
VMB250

IN/OUT SCHEMATIC DIAGRAM

(VCR PCB)



NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

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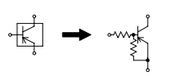
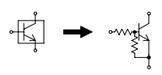
CAUTION: DIGITAL TRANSISTOR

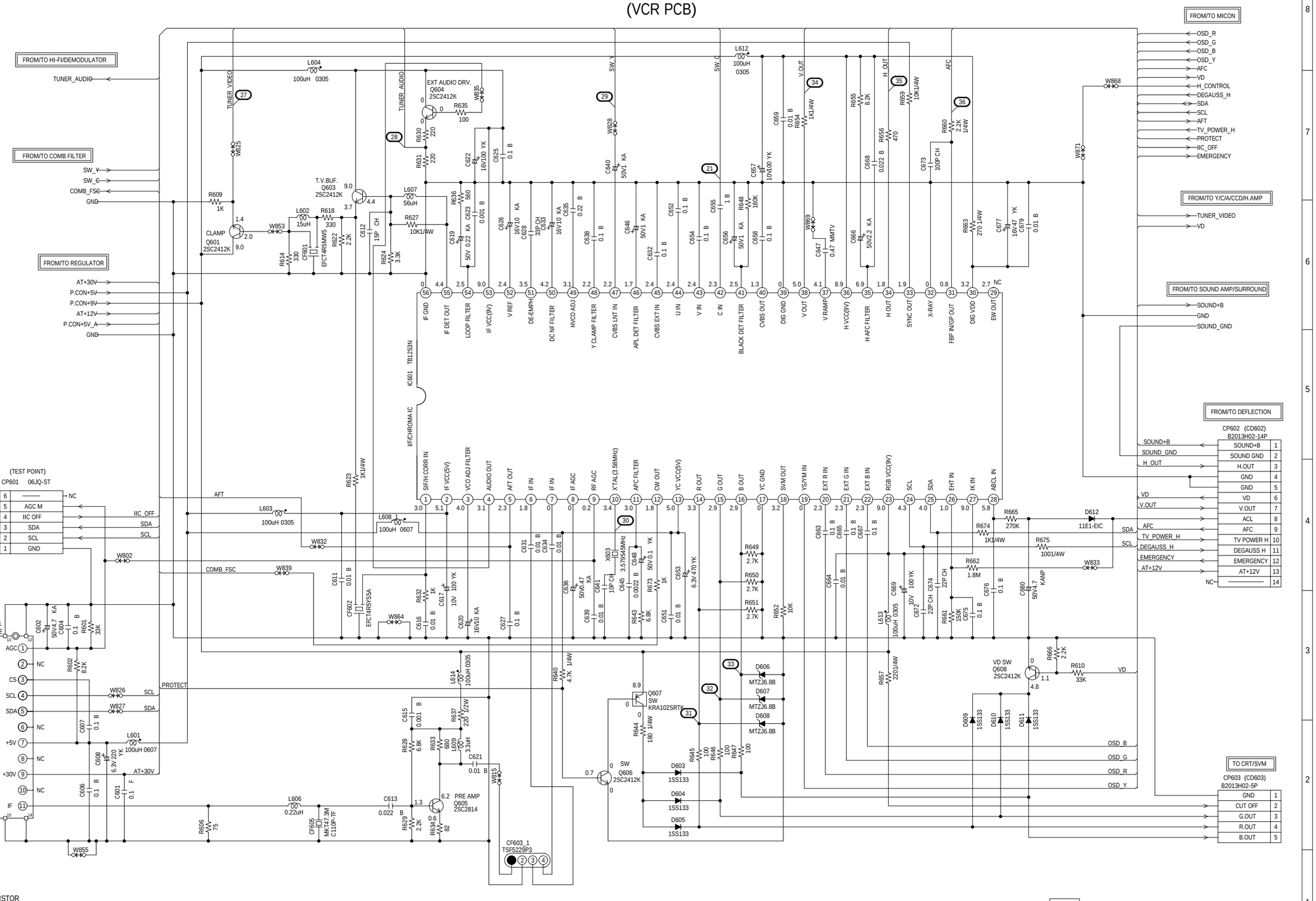


CAUTION: DIGITAL TRANSISTOR



CHROMA/IF SCHEMATIC DIAGRAM

(VCR PCB)



SOUND AMP SCHEMATIC DIAGRAM

(VCR PCB)

SOUND AMP IC
IC352 AN7522

HS351
763WAAA0224

C350 25V10 YK
C358 0.0056 B
C302 0.0056 B
R357 1K
R356 100K 1/4W
C321 25V2200 YK

FROM/TO CHROMA/IF
SOUND+B
SOUND_GND
GND

FROM/TO MICON
TV_POWER_H
TV_A_MUTE
SCL
SDA
R353 68K 1/4W
R359 47K
C357 25V22 KA

MUTE SW
Q350
2SC2412K

FROM/TO I/O
SURROUND_L
SURROUND_R
SOUND_R+
SOUND_L+
SP_OUT_R
SP_OUT_L
SOUND_GND

C324 470P B
C322 470P B
C313 470P B
C320 470P B
14

CP303
A2502WR2-4P
SOUND R+ 1
SOUND R- 2
SOUND L- 3
SOUND L+ 4

CD303
CU147401

SPEAKER
SP351
SG04H02BRA
8 OHM

SPEAKER
SP352
SG04H02BRA
8 OHM

FROM/TO DVD I/O
SW_AUDIO_OUT_L
SW_AUDIO_OUT_R
W830

FROM/TO REGULATOR
P.CON+9V
P.CON+5V
GND
W843
W985
W829

L302
100uH 0607

R310
R309 220 1/4W
220 1/4W

C323 0.033 B
R306 1.8K
C304 0.022 B
C306 0.47 B
C312 50V10 YK
R316 3.3K
R303 3.3K
R308 1.8K
R302 1.8K
C315 16V47 YK
C316 0.1 B
C301 50V4.7 KA
R304 4.7K
R305 4.7K
C303 0.033 B
R307 1.8K
C311 50V10 YK

DIGITAL SOUND CONTROL
M62420FP
IC301

REF
VR1
VR2
SIMAMP1
VOLAMP1
SIMAMP2
VOLAMP2
VR3
VR4
VR5
VR6
136K
1.8K
6.5K
TONE AMP1
TONE AMP2
I2C BUS INTERFACE
CONTROL LOGIC

W838
C314 50V0.47 YK
R317 100 1/4W
R318 100
W837
C318 100P CH
C319 100P CH
C325
R311 100K
C308 50V0.47 YK
0.001 B
C309 16V47 YK
C317_1 0.1 MMTV
C310 0.022 B
L301 100uH 0607

PCB010
VMB250

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

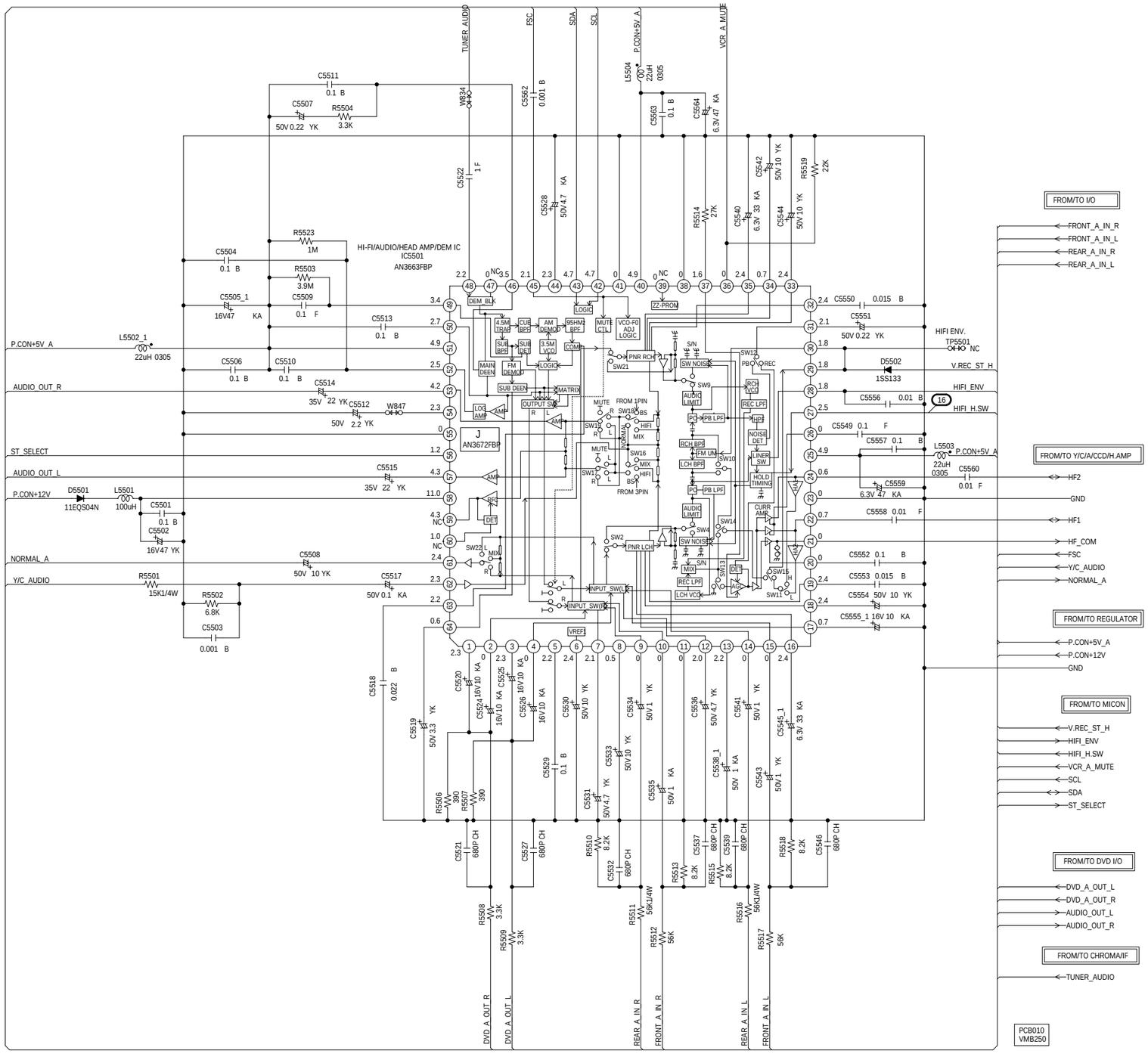
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

Hi-Fi/DEMODULATOR SCHEMATIC DIAGRAM

(VCR PCB)

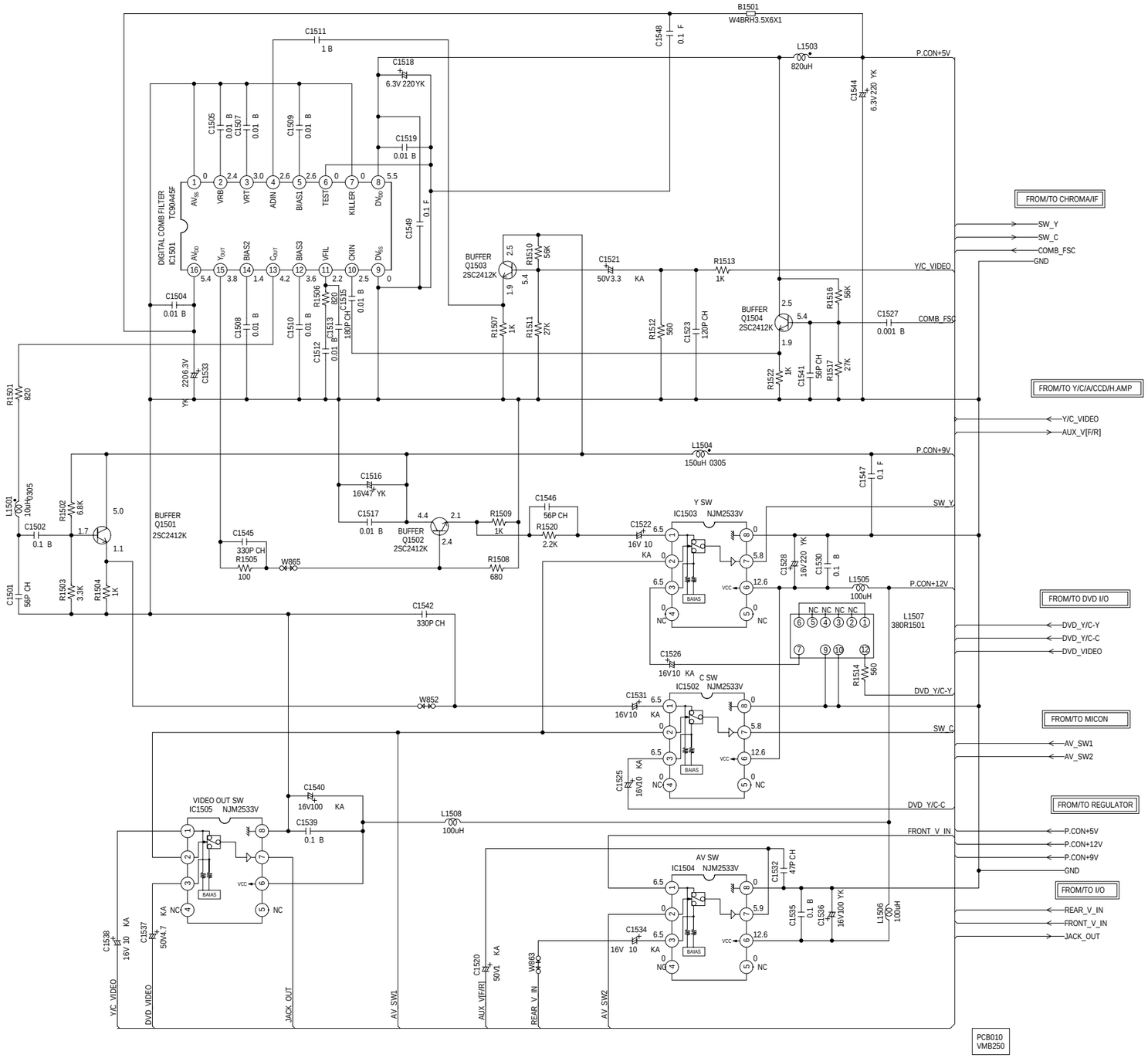


NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

COMB FILTER SCHEMATIC DIAGRAM

(VCR PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

DVD IN/OUT SCHEMATIC DIAGRAM (VCR PCB)

FROM/TO AUDIO/VIDEO

CP8001 (CD8501)
A2001WV2-13P

1	TX
2	RX
3	GND
4	GND
5	P.CON+9V
6	P.CON+9V
7	P.CON+D5V
8	P.CON+D5V
9	GND
10	P.CON+3.3V
11	P.CON+3.3V
12	GND
13	SPDIF-134

C8017 0.01 B
R8008 4.7K
R8009 4.7K
B8006 W4BRH3.5X6X1
W844
C8016 47P CH

FROM/TO AUDIO/VIDEO

CP8002 (CP8502)
IMSA-9604S-18Z14

1	Y(G)
2	GND
3	C(CVBS)
4	GND
5	CVBS
6	GND
7	DVD U(B) → NC
8	GND
9	DVD V(R) → NC
10	GND
11	DVD Y(G) → NC
12	GND
13	AUDIO-L
14	GND
15	AUDIO-R
16	ZERO
17	DVD RESET
18	→ NC

R8010 820
R8011 75
B8002 BLM21A601SPT
C8044 0.1 B

ZERO MUTE SW Q8006 2SC2412K
ZERO MUTE SW Q8007 KRC103SRTK

R8012 4.7K 1/4W

FROM/TO SOUND AMP
SW_AUDIO_OUT_L
SW_AUDIO_OUT_R

AV_SW1
AUDIO_OUT_L
C8001 16V10 KA
AUDIO SW IC8001 NJM2533V
SW_AUDIO_OUT_L
L8001 100uH 0305
C8012 0.1 B
C8013 16V100 YK
P.CON+12V

FROM/TO I/O
ZERO
SPDIF-134

FROM/TO COMB FILTER
DVD_Y/C-Y
DVD_Y/C-C
DVD_VIDEO

AUDIO_OUT_R
C8009 16V10 KA
AUDIO SW IC8002 NJM2533V
SW_AUDIO_OUT_R
L8003 100uH 0305
C8014 0.1 B
C8015 16V100 KA
P.CON+12V

FROM/TO MICON
TX
RX
DVD_RESET
AV_SW1

C8006 16V10 KA
C8007 16V10 KA

AT+5.2V

FROM/TO REGULATOR
GND
P.CON+3.3V
P.CON+5V_D
P.CON+12V
P.CON+9V_DH
AT+5.2V

DVD_A_OUT_L
DVD_A_OUT_R

FROM/TO Y/C/A/H.AMP
DVD_VIDEO

FROM/TO HI-FI/DEMODULATOR
DVD_A_OUT_L
DVD_A_OUT_R
AUDIO_OUT_L
AUDIO_OUT_R

C8030 0.1 F
C8002 16V220 YK
C8005 50V2.2 KA
R8022 10 1/4W
C8070 0.0015 B
C8081 100P CH
R8051 12K
R8054 8.2K
R8056 3.9K
R8023 10K
R8049 10K
C8004 16V22 KA
W851
R8027 1K
R8020 4.7K
C8023 50V2.2 NA
R8024 100K1/4W
R8021 4.7K
C8022 50V2.2 NA
R8025 100K1/4W
IC8004 NJM4580M MIXER
C8077 0.0015 B
C8003 16V22 KA
W850
C8064 820P CH
R8047 1K
C8065 10V 33 KA
R8050 12K
C8025 820P CH
R8026 10K
R8048 10K
R8052 8.2K
R8053 3.9K
C8102 50V 2.2 KA
C8079 100P CH

PCB010
VMB250

CAUTION: DIGITAL TRANSISTOR

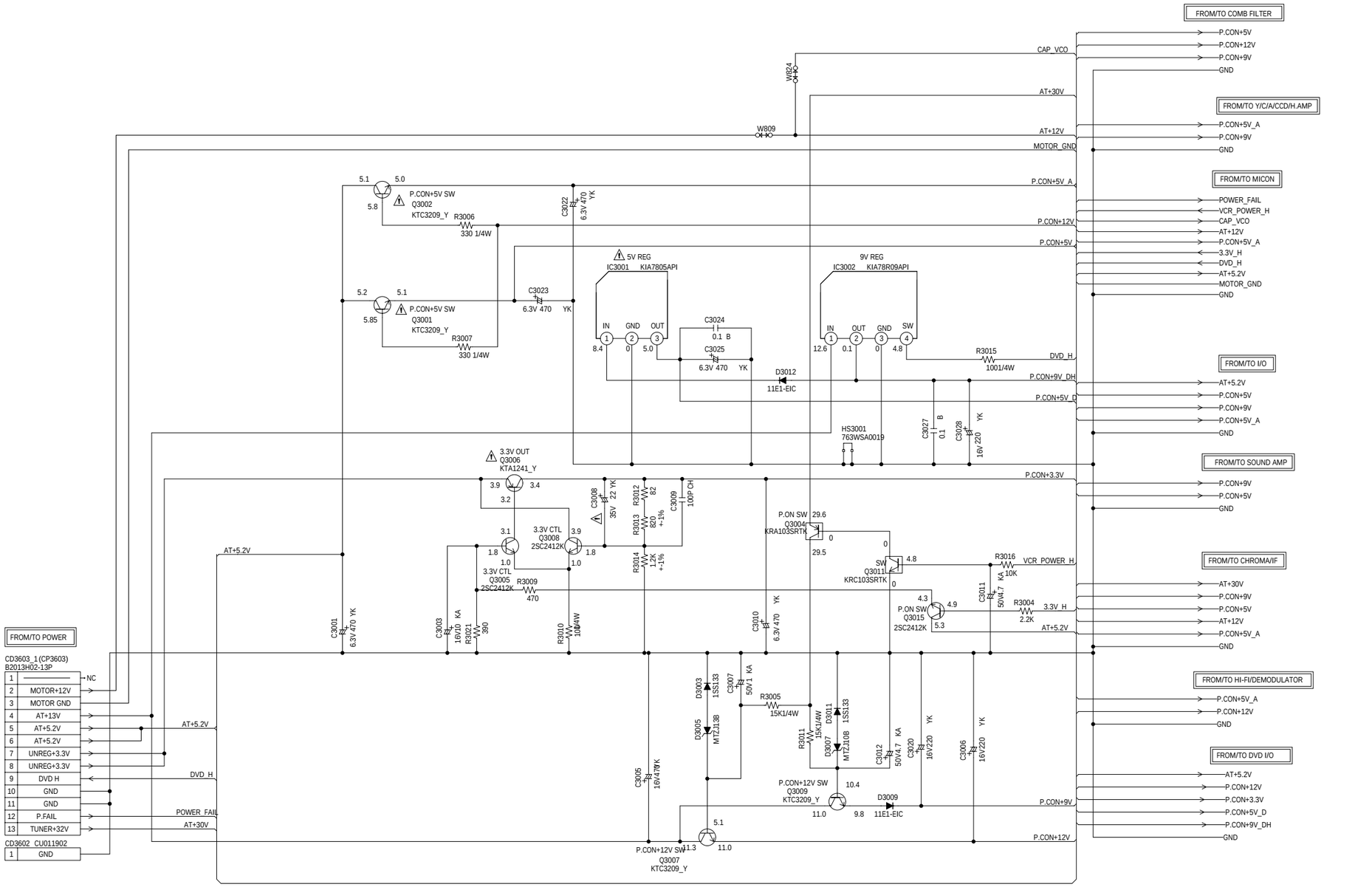
NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR.
THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

REGULATOR SCHEMATIC DIAGRAM

(VCR PCB)



NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

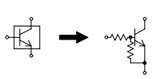
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

CAUTION: DIGITAL TRANSISTOR

CAUTION: DIGITAL TRANSISTOR



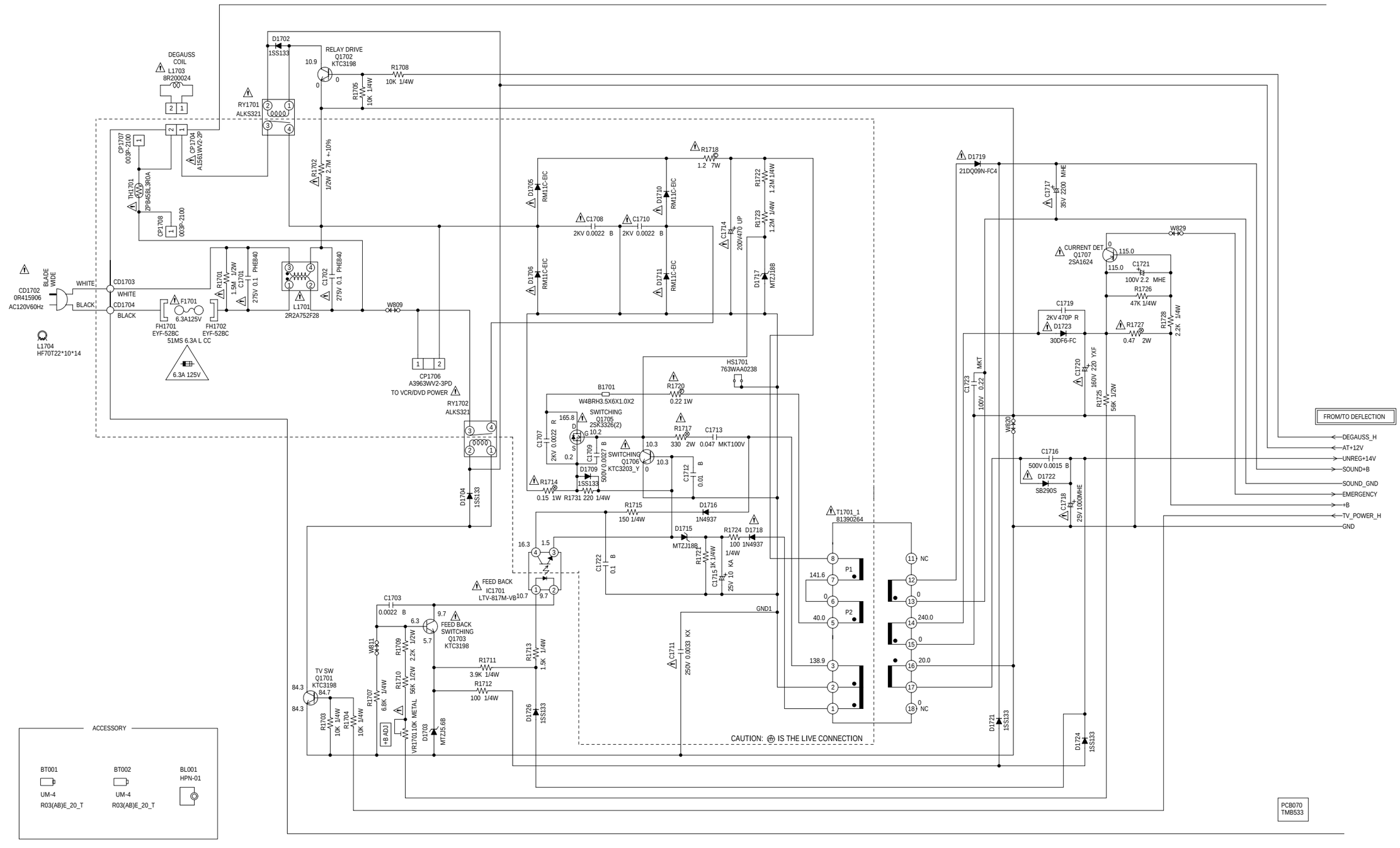
TV POWER SCHEMATIC DIAGRAM

(MAIN PCB)

6.3A 125V

CAUTION:FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE FUSE 6.3A 125V (F501).

ATTENTION:POUR UNE PROTECTION CONTINUE LES RISQUES D'INCEIE N'UTOLISER QUE DES FUSIBLE DE MEME TYPE 6.3A 125V (F501).



NOTE:THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

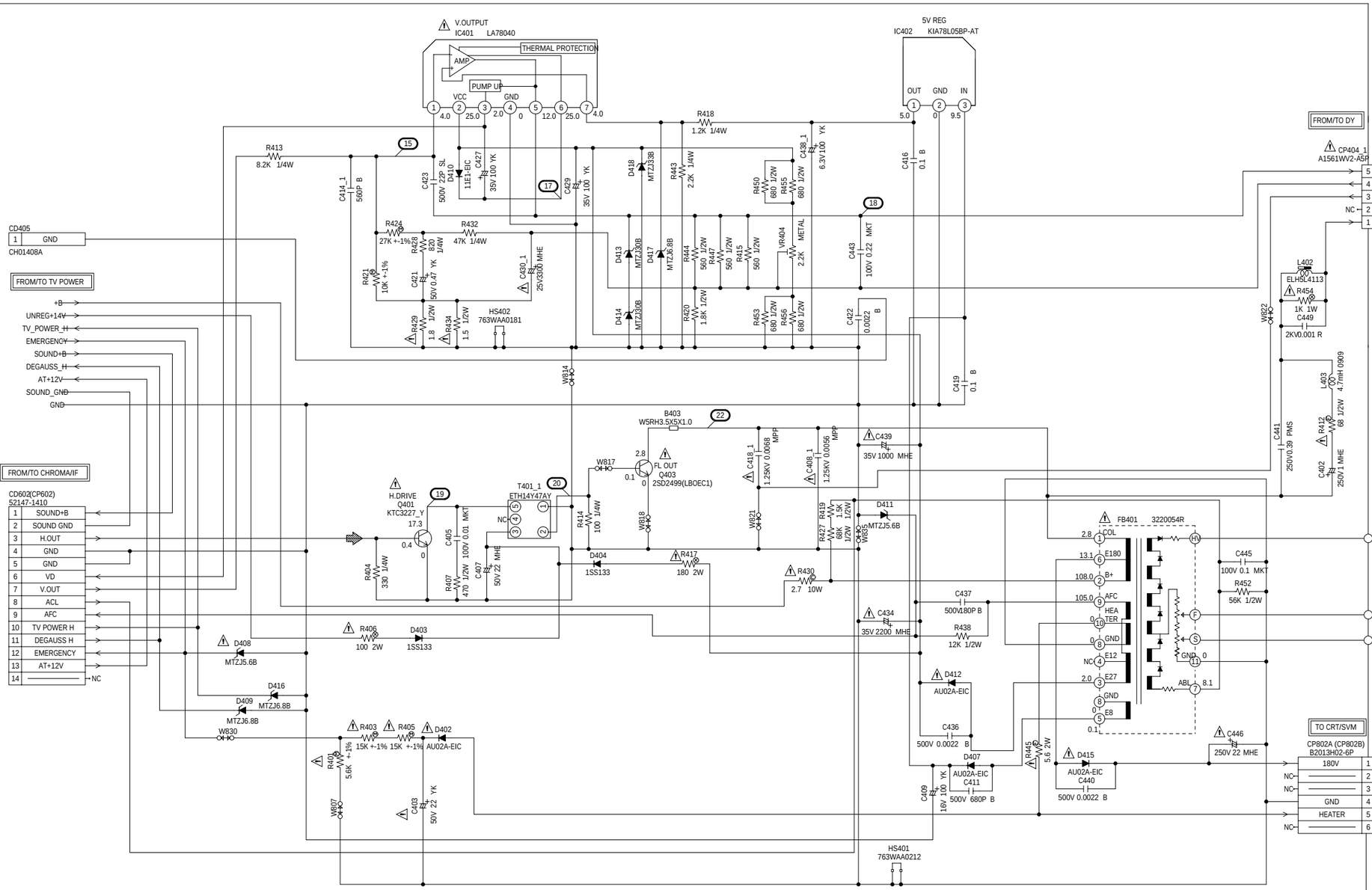
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

DEFLECTION SCHEMATIC DIAGRAM

(MAIN PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE。

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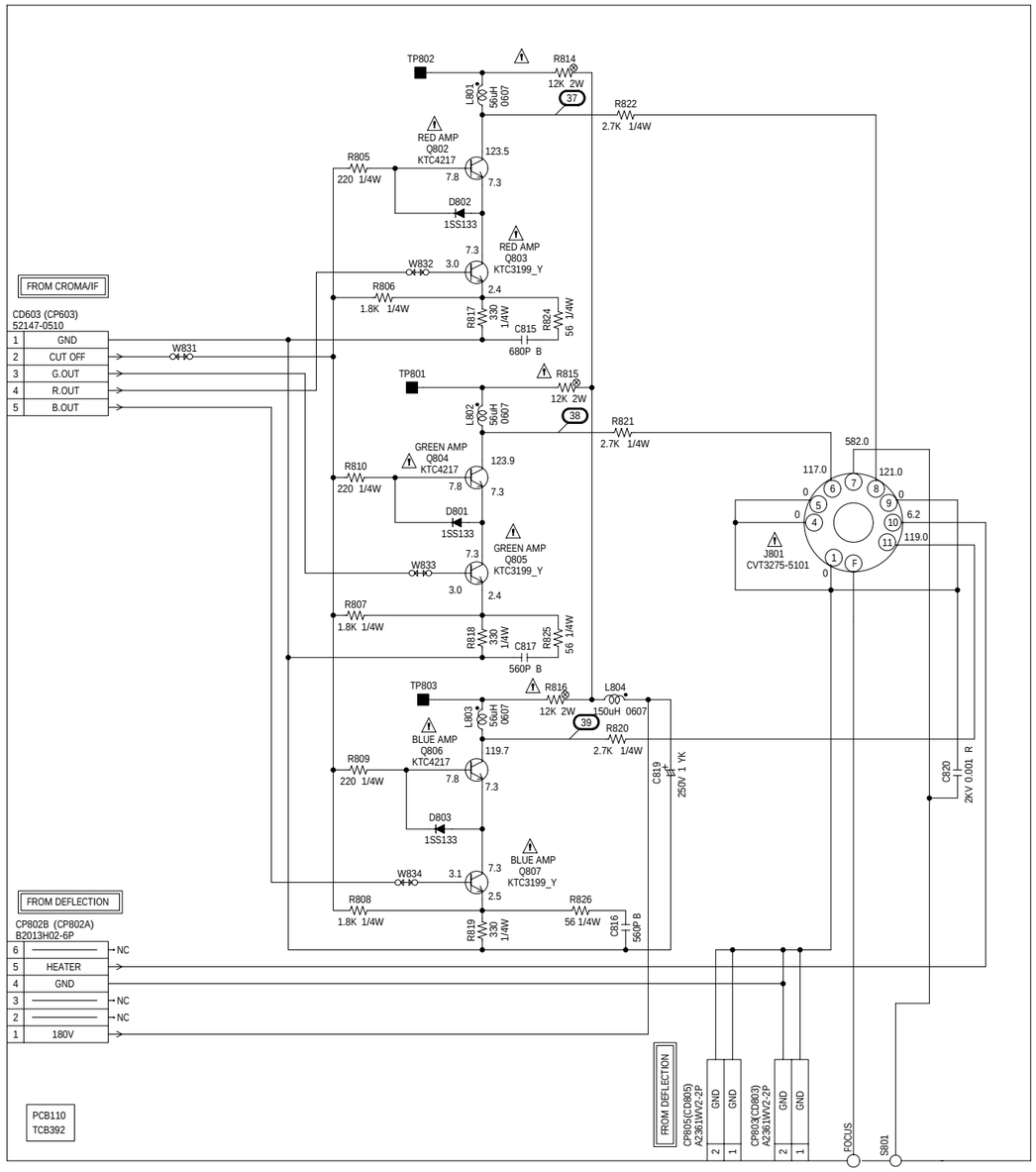
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

NOTE: THE RESISTOR MARKED F IS FUSE RESISTOR. THE ALUMI ELECTROLYTIC CAPACITOR MARKED NP IS NON POLAR ONE.

CRT/SVM SCHEMATIC DIAGRAM

(CRT PCB)



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER WHEN THE COLOR BROADCAST WAS RECEIVED IN GOOD CONDITION AND PICTURE IS NORMAL.

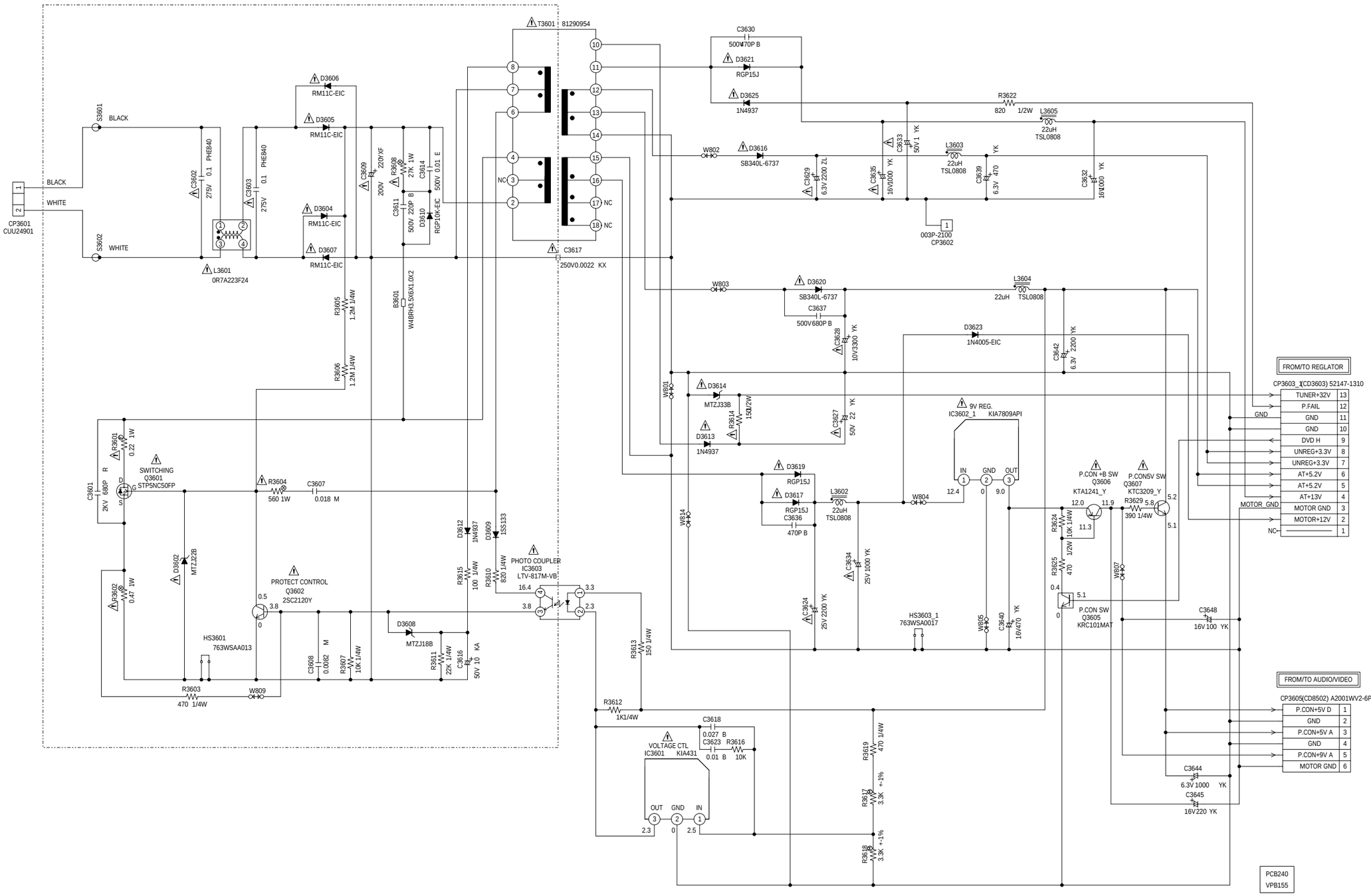
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

POWER SCHEMATIC DIAGRAM

(POWER PCB)



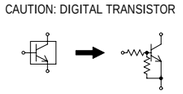
CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

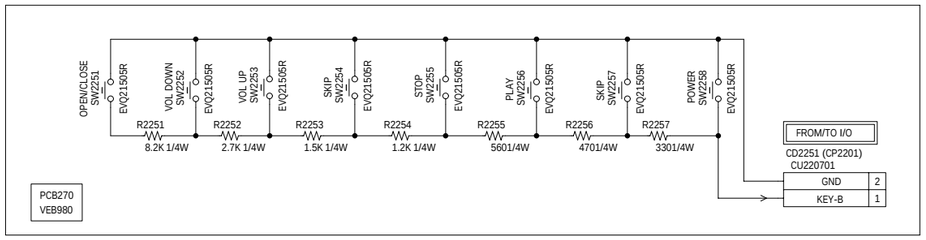
NOTE:THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

CAUTION: DIGITAL TRANSISTOR



OPERATION SCHEMATIC DIAGRAM

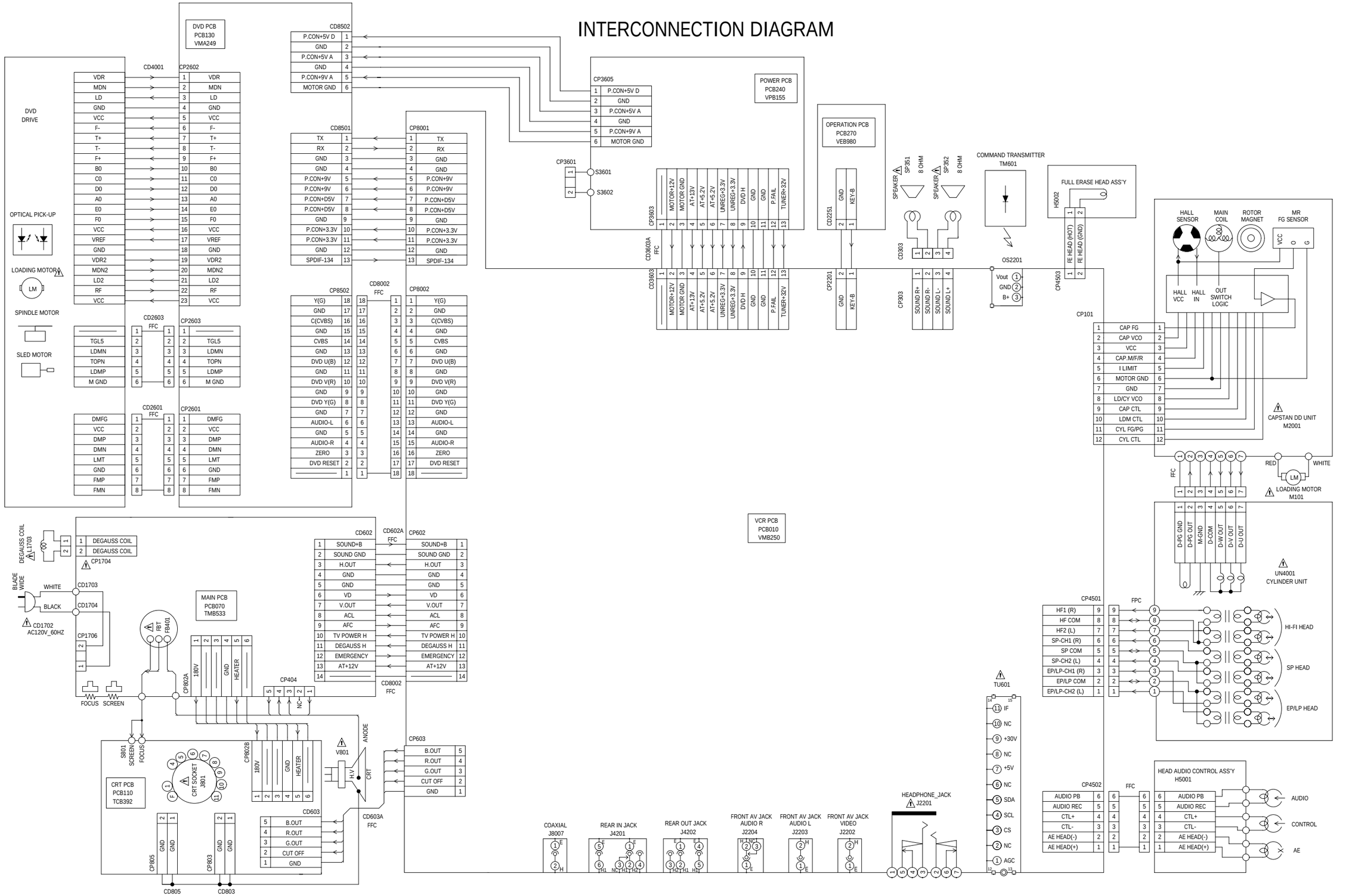
(OPERATION PCB)



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

NOTE: THE DC VOLTAGE EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

INTERCONNECTION DIAGRAM



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY,USE ONES DESCRIBED IN PARTS LIST ONLY 。

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES。

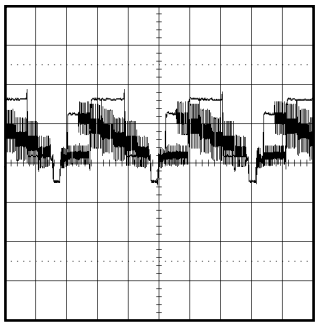
NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE 。

WAVEFORMS

Y/C/AUDIO/CCD/HEAD AMP

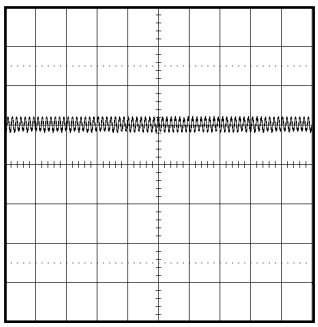
20µs
1.0V

①



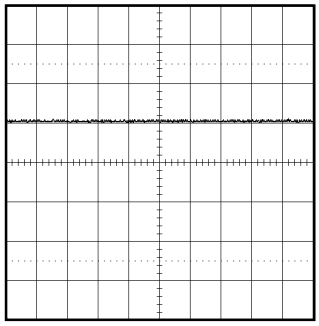
2µs
1.0V

②



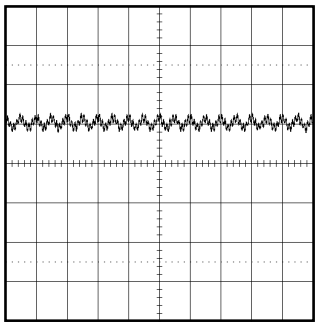
1ms
1.0V

③



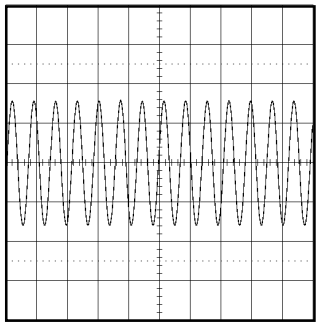
5ms
2.0V

④



20µs
20V

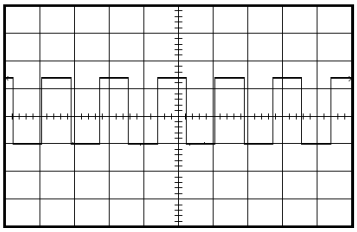
⑤



MICON

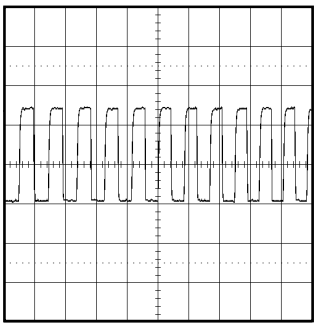
20ms
2.0V

⑥



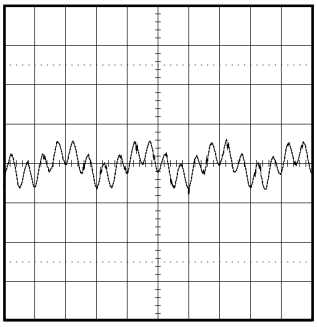
1ms
2.0V

⑦



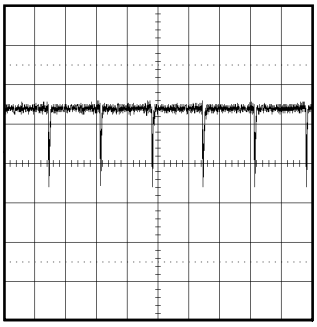
1ms
200mV

⑭



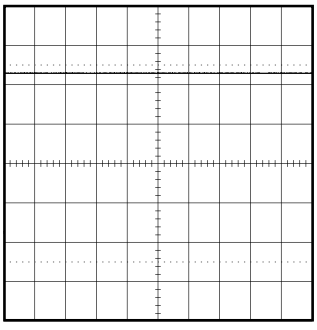
10ms
0.5V

⑮



1ms
1.0V

⑯



SOUND AMP

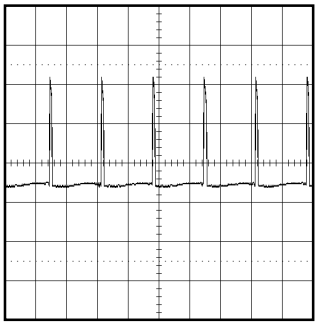
DEFLECTION

Hi-Fi/DEMODULATOR

DEFLECTION

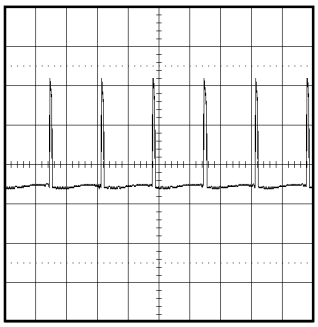
10ms
10V

⑰



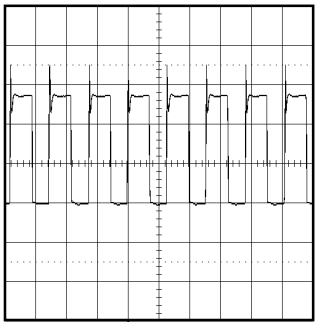
10ms
10V

⑱



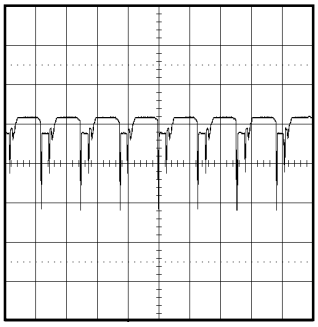
50µs
10V

⑲



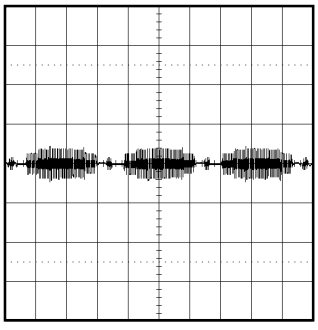
50µs
5.0V

⑳



20µs
0.5V

㉑



CHROMA/IF

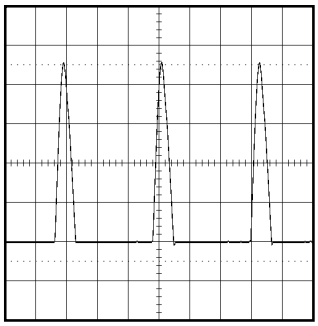
NOTH: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

DEFLECTION

20µs
200V

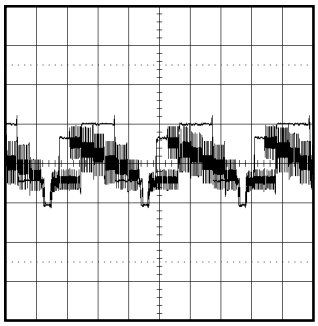
(22)



CHROMA/IF

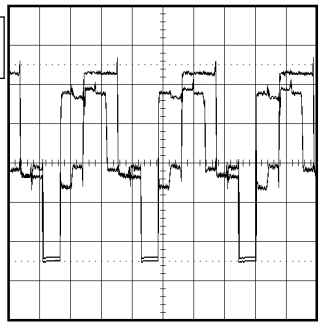
20µs
0.5V

(27)



20µs
1.0V

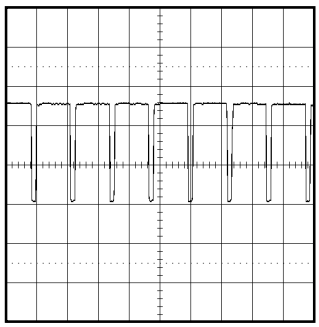
(32)



MICON

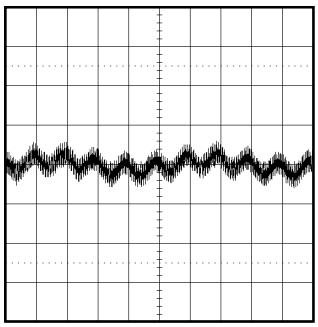
50µs
2.0V

(23)



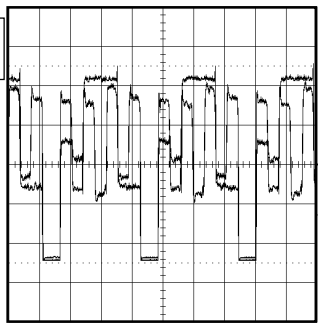
0.5ms
0.5V

(28)



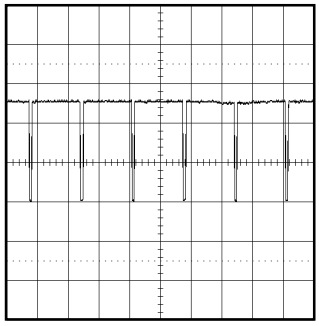
20µs
1.0V

(33)



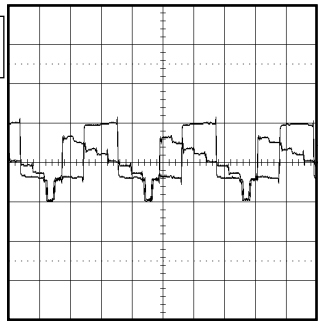
10ms
2.0V

(24)



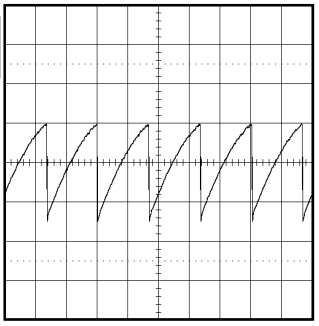
20µs
0.5V

(29)



10ms
1.0V

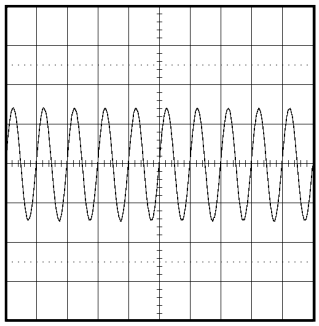
(34)



DVD I/O

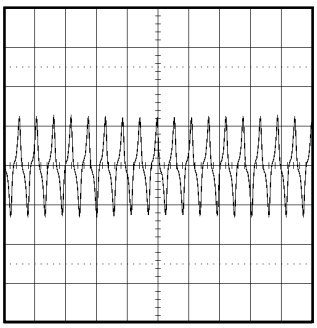
1ms
2.0V

(25)



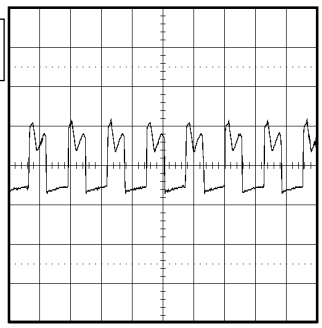
0.5µs
100mV

(30)



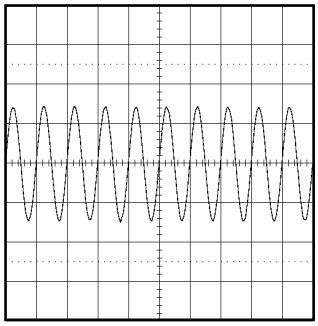
50µs
0.5V

(35)



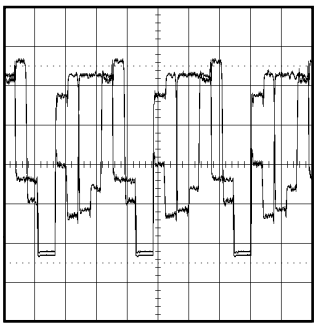
1ms
2.0V

(26)



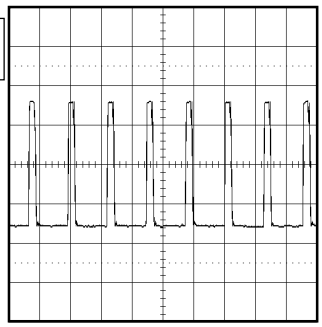
20µs
1.0V

(31)



50µs
2.0V

(36)



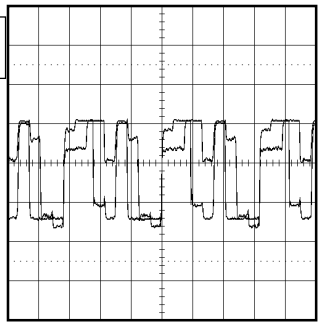
NOTH: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

CRT/SVM

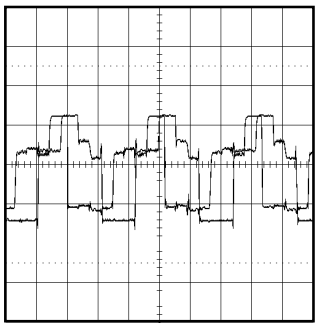
20µs
50V

(37)



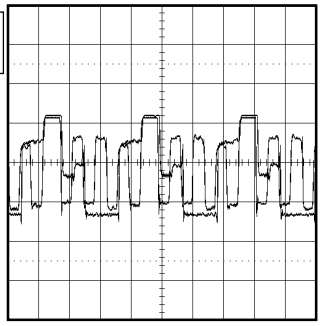
20µs
50V

(38)



20µs
50V

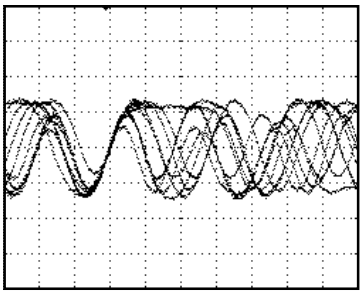
(39)



DSP

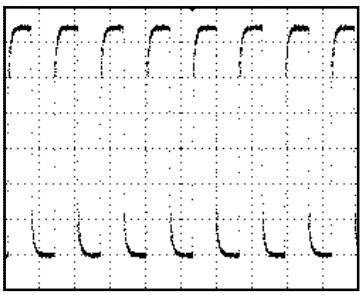
20ns
100mV

(52)



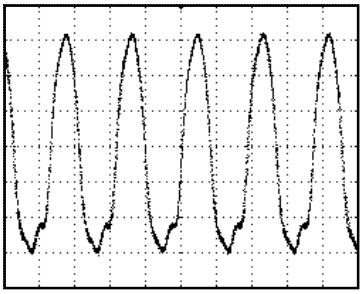
500ns
50mV

(53)



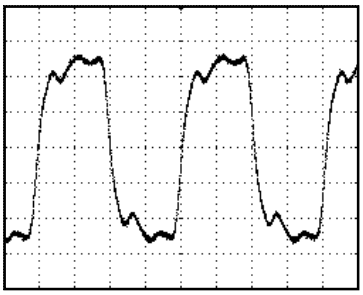
20ns
100mV

(54)



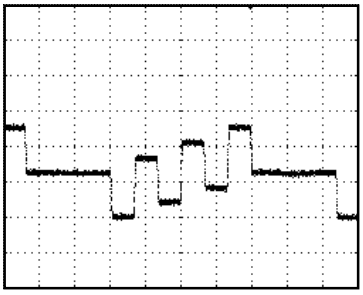
20ns
100mV

(55)



10µs
20mV

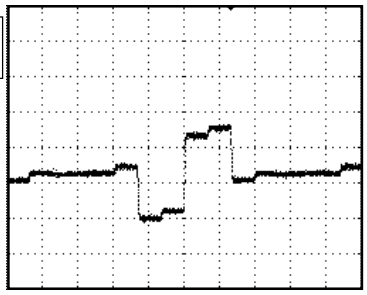
(56)



MPEG

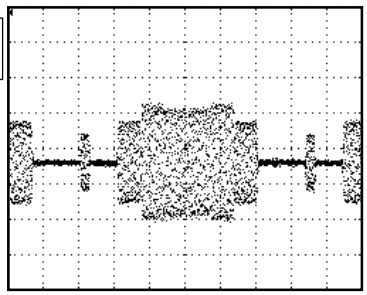
10µs
20mV

(57)



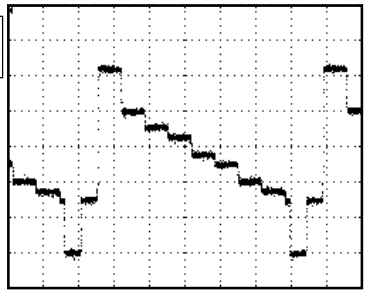
10µs
20mV

(58)



10µs
20mV

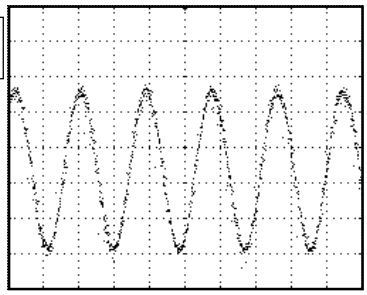
(59)



MEMORY

5ns
20mV

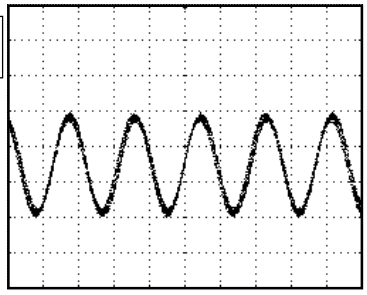
(60)



AUDIO/VIDEO

20ns
50mV

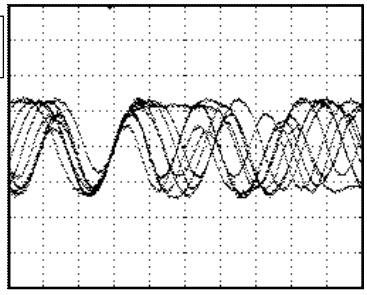
(61)



READ

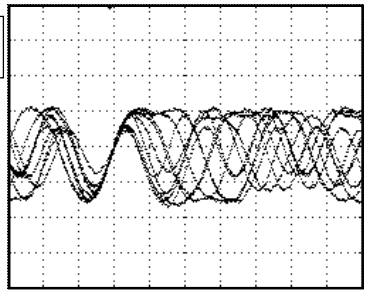
100ns
50mV

(50)



100ns
50mV

(51)

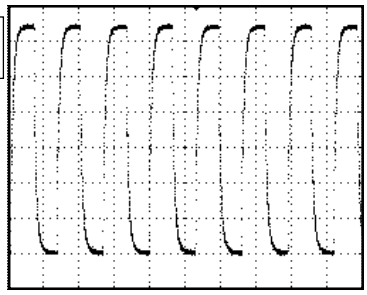


NOTH: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

WAVEFORMS

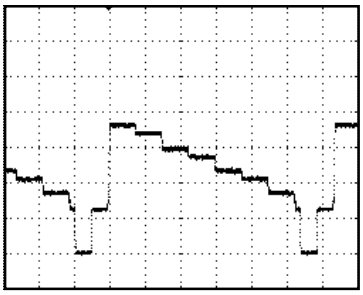
500ns
50mV

62



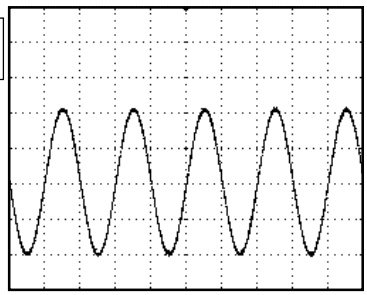
10µs
50mV

67



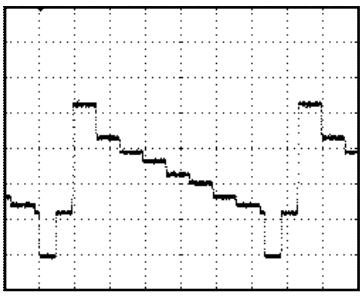
500µs
50mV

63



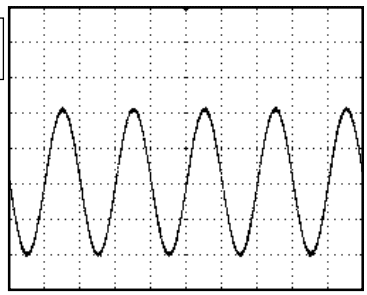
10µs
50mV

68



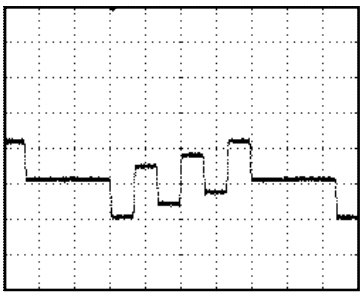
500µs
50mV

64



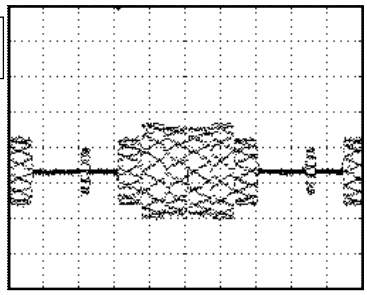
10µs
50mV

69



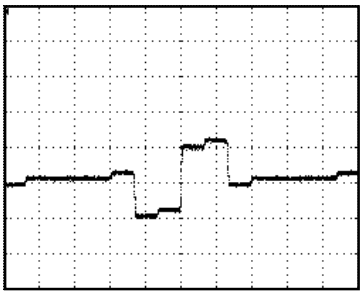
10µs
50mV

65



10µs
50mV

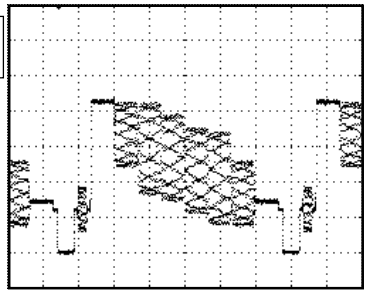
70



SYSCON1

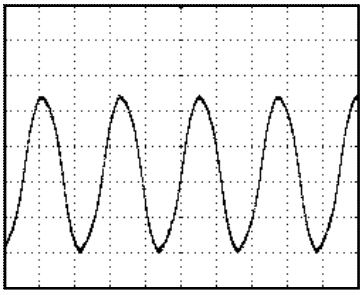
10µs
50mV

66



50ns
100mV

71



NOTH: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

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